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An Address
ON THE
VIS MEDICATRIX NATURÆ.

Delivered to the Medical Society of Leamington on Oct. 20th, 1923,

BY SIR FREDERICK W. MOTT, K.B.E., F.R.S., M.D., LL.D., F.R.C.P. LOND.

A RECENT visit to Leysin in Switzerland, where I saw how much could be done in the prevention and cure of disease by sunlight, pure dry air and the atmosphere of cure, has led me to select as a subject the vis medicatrix naturæ. I considered this appropriate for an address to medical men practising in a town which has long been famous as a health resort. It was Voltaire who said that doctors pour medicines of which they know little, into bodies of which they know less. Since the days when he lived medical science has made great strides, and doctors now know much more about the physiological action of drugs and of the structure and functions of the human body. Every year brings fresh discoveries of the auses of disease and of the means by which they mayc be prevented and cured. Medical men might now resent the dictum of Voltaire which I have quoted, but they would recognise the truth of the following principles which he laid down :—

Régime in diet is better than medicine. Eat moderately what you know by experience you can digest, for only that which you can digest is good for the body. What is the medicine which makes you digest? Exercise. What will repair your energy? Sleep. What will lessen incurable ills? Patience. What can change a bad constitution? Nothing.

This is my text, with the benefits of sunlight and pure air added.

The body is a store of energy which is continually being discharged in the performance of vital functions and renewed during sleep. The maintenance of the balance between storage and discharge of energy under varying environmental conditions largely depends upon the inborn constitution or natural defences of the body against noxious agents from without. This inborn disposition is strengthened by a healthy regular mode of life and freedom from anxiety and worry which, by hindering digestion, assimilation, and nutrition, and by causing sleeplessness, prevents storage and recuperation of energy.

MICROBES AND DISEASE.

The germ-theory of disease initiated by Pasteur laid the foundations of modern medicine and surgery, and I was a student at University College when antiseptic surgery was introduced to London by Lister. At that time a great discussion was taking place between Pasteur and his followers with my teacher the late Dr. Charlton Bastian on spontaneous generation. Dr. Bastian showed that water in which a little hay had been boiled for some time and the flask sealed up generated bacilli, and he argued from this that spontaneous generation of the microbes had occurred. His facts were right, but his inference was wrong, for it was subsequently shown that the desiccated spores of bacilli resist boiling. This was a new fact of great practical importance, especially in regard to such diseases as tetanus and anthrax. Prof. Tyndall took part in the controversy and showed that culture-tubes could be opened in a pure atmosphere, such as at the top of the Bel Alp in Switzerland, without germs generating; because the pure atmosphere on a mountain reveals in a beam of sunlight very few floating particles, and sunlight, as shown by Downs and Blunt as early as 1877, has a powerful bactericidal action. I was much impressed by these experiments of Tyndall, reasoning that inasmuch as particles of coal dust get into the lungs and are deposited there, it was possible that germs of disease might get into the body but be continually destroyed by the natural defences. The skin and mucous surfaces of the respiratory and alimentary canals act as natural barriers against the entry of micro-organisms; still I thought that inasmuch as osteomyelitis, an infective disease, occurs without the mode of entry of the germs being known, it was possible for microbes to pass through the mucous and other barriers and get into the tissues and fluids of the body. To test this question of entry of microbes into the body during life, in conjunction with my fellow-student Victor Horsley, a number of experiments of the following nature were made: Animals were killed and their organs (for example, kidneys and spleen) were taken out under the spray, placed in pots containing boiling paraffin, and these were kept at the body temperature in an incubator. The organs were thereby cooked on the outside, nevertheless the middle parts underwent putrefaction, causing the paraffin to dome up with gases formed by the generation of micro-organisms. It could not be said that these animals were kept under hygienic conditions; and it may be assumed that at the time of their death some organisms or their spores were still in the organs undestroyed, possibly in leucocytes.

These experiments would suggest that in unhygienic environmental conditions the natural defences of the body are engaged in a continuous struggle against numbers of microbes, specific or otherwise. Consequently, if the body is invaded by a specific organism causing at first a local lesion, such as tuberculosis, the natural defences would be less available to combat the disease. For similar reasons impure air and unhygienic conditions favour secondary microbial infection by pyogenic organisms. This is the most frequent cause of fatal results in tuberculosis, influenza, scarlet fever, small-pox, &c. The importance of chronic septic infection by pyorrhœa alveolaris, by decayed teeth and stumps, or by infected tonsils cannot be over-estimated. They are a continuous drain on the natural defences of the body and act as a direct or indirect cause of many diseases.

THE BACTERICIDAL ACTION OF SUNLIGHT.

Robert Koch, in 1890, showed the great sensibility of tubercle bacilli to sunlight, and Strauss proved that two hours' exposure to light was sufficient to sterilise a culture. Sputum containing bacilli spread out on a glass plate are killed in ten minutes by the action of sunlight. The rays which kill are not in the spectrum but are in the ultra-violet rays. The freedom of the air from micro-organisms largely, therefore, depends upon sunshine, and this supports the proverb "Where the sun does not enter the doctor goes." In 1893 Finsen published his first series of experiments upon phototherapy or heliotherapy. This led to a great advance in our knowledge of the properties of light in relation to the treatment of skin diseases. Sunlight for the treatment of wounds was first employed by Bernhard of Samaden in 1902, who, having discovered the absence of putrefaction of meat when exposed to the action of the sun in a high mountain atmosphere, treated a large operation wound by exposure of the affected part to the rays of the sun. The result was so satisfactory that he was led to extend the application of sunlight to tuberculous lesions. The greatest credit is due to Dr. Rollier, who in 1903 opened the first clinic for surgical tuberculosis. Unlike Bernhard, he advocated the general sun-bath as distinct from the local sun-bath. So great was his success that in 1910 he opened his École du Soleil at Cergnat, near Leysin, for the treatment of children predisposed by enlarged glands to tuberculous infection. The principle of heliotherapy introduced by Dr. Rollier has been adopted with great success by Sir Henry Gauvain at Alton and Hayling Island, and recently in other places. Sir Henry Gauvain in a foreword to the translation of Dr. Rollier's work "Heliotherapy"[1] points out that—

The sun's rays are the source of all vital energy, they are the great vital tonic..... Dr. Rollier, he remarks, is the high priest of the modern sun-worshipper. His work is not only a revelation, but an inspiration. His methods of treatment

[1] Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923.

stimulate rather than supplant the efforts of Nature to defend the body against disease. Its value in preventive medicine will be increasingly appreciated after experience in its employment has been acquired. He advocates schools in the sun, insolation in the isolation hospitals, and transference of hospitals for chronic disease to sunny localities. Wherever the sun shines and the requisite skill exists for its utilisation, there insolation may be usefully employed.

From my own knowledge gained at Leysin, I can endorse all that Sir Henry Gauvain says.

Sunlight and Rickets.—Now there is a disease which is known abroad as the Englische Krankheit because of its prevalence in this country. It is rickets. We have rightly regarded improper feeding of infants as the cause of this disease (a food-deficiency disease)—lack of fat-soluble vitamins; but this is not the only cause; overcrowded dwellings where the sunlight hardly ever enters, such as are found to be the habitations of millions of our poor population dwelling in towns and cities, are as much responsible for this English disease as food deficiency. That this is so is shown by what happened to the children of Germany who suffered with rickets on account of a deficiency of animal fat, for it was found at Frankfort that a daily sun-bath (in spite of the continuance of the food deficiency) prevented the occurrence of rickets. Dr. Alfred Hess, of Columbia University, at the Home for Hebrew Infants, New York, found that the amount of phosphorus in the blood of babies rises from spring to autumn and falls from autumn to spring, whilst the incidence of rickets consentaneously falls and rises.

SUN CURE OF SURGICAL TUBERCULOSIS AT LEYSIN.

Impressed by the reported great success of the sun cure I recently took the opportunity offered to English medical men of visiting Leysin, and I attended a short course of lectures and demonstrations given by Dr. Rollier and his staff of assistants and experts. Dr. Rollier, with whom I had several conversations, told me that he was formerly an assistant of the great Swiss surgeon, Prof. Kocher of Berne, but he was obliged to leave Berne on account of his wife's health, and he had to seek a place where there was no practising doctor, but where there was plenty of sunshine and pure air. His wife made a perfect recovery and has assisted him in his great pioneer work, which he has the satisfaction of seeing rapidly spreading to all civilised countries. He told me that he had seen the failure of surgical intervention in tuberculosis of the bones, the spine, and joints, and that this had led him to try heliotherapy. He took us to the châlet where he commenced the sun treatment. This small clinic contains about 30 of the poorer class of patient, but there are now a great many clinics for all classes of patients who come from all parts of the world. The one I stayed in, "Miremont," was like a very first-rate hotel, with large sunny rooms, each with a verandah on to which the bed could be wheeled, well-furnished and appointed, and the meals, although simple, were wholesome and appetising. On the top of the building was the solarium and the patients were taken up in their beds in a lift. Concerts and broadcasting from Paris, kinematograph, and performances by the staff and some of the convalescent patients were given several nights while I was there.

Lectures and Demonstrations.—The lectures and clinical demonstrations were given by Dr. Rollier and his assistants. The expert radiologist, Dr. H. J. Schmid, showed a series of skiagrams of normal conditions of the spine, the pelvis, and bones of the limbs, followed by demonstrations of excellent skiagrams and various pathological lesions of these structures, especially of those due to tuberculosis and osteomyelitis. In the course of these demonstrations a number of skiagrams of lesions of these structures before and after treatment were exhibited.

Dr. Rollier pointed out that the whole principle of the treatment of tuberculous disease of bones and joints was to obtain a spontaneous cure. The only surgery performed was the aspiration of pus by puncture with a trocar when an abscess had formed, and this was rarely necessary. He said it was the secondary infections that did the mischief and were so difficult to combat successfully, because the suppuration, if prolonged, caused amyloid disease. In his clinical lectures he showed the mode of treatment and the results obtained both by photographs before treatment, and skiagrams taken at intervals during treatment. The patients were brought into the lecture room on movable beds. He explained and demonstrated the various devices he adopted for the extension of hip, knee, and ankle to prevent deformity while undergoing the sun cure. It was remarkable how well developed the muscles of these patients were, in spite of prolonged immobility, and he attributed this to the action of the sun's rays producing an increased flow of blood to the parts exposed. It is possible, as will be pointed out later, that energy may be absorbed by the blood and distributed over the whole body, and it is not improbable that by the stimulating action of the light the reflex tonic contraction of the muscles and their nutrition are increased.

At the clinics which I visited I saw cases of Pott's disease kept lying on their faces, and by means of supporting bags, filled first with millet seed and later with sand, spinal curvature was gradually reduced during exposure to the sun's rays. The products of inflammation are thereby absorbed, granulation tissue is formed, and calcification with fixation takes place. Many cases were shown, and X ray pictures before and after treatment exhibited. Two young girls with hip disease who had recovered, with admirable movement and able to bend hip and knee and ankle, were shown to us, and it would have been difficult from their walk to know that there had been grave disease. Dr. Rollier said he had never had a case of tuberculous ankle or wrist in which free movement had not followed treatment. Particularly interesting were some skiagrams of a case of tuberculous knee-joint before and after treatment. These skiagrams clearly demonstrated that not only were all the inflammatory products absorbed, but that new cartilages had been formed having a normal appearance. This seemed difficult to explain, and I would suggest that just as in regeneration of a nerve after section the new outgrowing fibres from the central end find their proper termination in the skin and muscle as if by an innate association cell-memory, so the undestroyed cartilage cells proliferate, and by an innate memory so dispose themselves under the stimulation of the dynamic forces of pressure, exercised in gait and station as to take on their original functions in the joint. Every stage of spondylitis and arthritis was shown in young and old and all were doing well and making for recovery. At the châlet, where Dr. Rollier first commenced the sun cure treatment, I saw an Englishwoman with tuberculous arthritis of the right shoulder with secondary microbial infection and suppuration. There were two fistulæ, besides which there was tuberculosis of both apices of the lungs. When she came to Leysin she had a swinging pyrexia and her photographs denoted misery and cachexia. Three months had elapsed, the temperature was normal, she looked, felt, and spoke as if she were a happy woman and hopeful of recovery. She had put on 9 kg. in weight, and under the healing and bactericidal influences of the sun and general improvement in health the fistulæ had healed up. Another remarkable case was one of Pott's disease in a child who came with abscess formation, prolonged suppuration, and albuminoid disease of liver and kidneys; this was treated in the usual way, but milk was the only nourishment for one year. The urine no longer contained albumin and the liver was no longer enlarged.

I saw a child that was freckled in the face and Dr. Rollier remarked that this patient would require very careful handling, as people with freckles did not pigment readily; likewise, the great difference between the skins of dark and blonde subjects must be borne in mind, as the latter are much more sensitive to sunlight and require extremely careful treatment if over-exposure is to be avoided. The experimental researches of Dr. P. Bloch point strongly to the fact that the formation of pigment must be

sought in an enzyme which he shows exists in the basal cells of the epidermis. It cannot be demonstrated experimentally in the skin of an albino animal. This ferment is activated by all agents which normally produce pigmentation, the action of light being particularly striking. It is called dopa-oxydase. It may be inferred that the Mediterranean type of human beings would have relatively much more of this ferment in the cells of the rete Malpighii (where pigment is normally deposited) than the Nordic type. It is not inconceivable that the freckling of the skin may point to an admixture of unblended Mediterranean and Nordic types of skin in which the latter is, for the most part of the body surface, dominant. The vulnerable parts of the skin to the invasion of micro-organisms are the sebaceous glands and hair follicles. Acne, boils, and carbuncles are caused by infections of these structures. Sun treatment by its bactericidal action prevents the occurrence of these affections. I did not see acne in any of the patients, nor did I see it in any of the boys and girls at the École du Soleil.

I will now briefly allude to some of the general principles of technique which I saw. The method consists in beginning always with the feet and insolating both legs and arms before exposing the abdomen and thorax. By this means a general idea of the tolerance of the patient to sunlight is attained before the more vulnerable parts of the body are exposed. Short periods of exposure alternating with periods of rest—e.g., 10 to 15 minutes—make the body tolerate a much greater total amount of sunlight than would be possible with one long sun-bath, which is more fatiguing to the patient and more irritating to the skin. A series of moderate reactions three or four times a day for 15 minutes causes more rapid acclimatisation than is the case with a single bath of 30 minutes. When once, by this graduated system of exposure, the patient is pigmented all over there is no longer any danger and the patient may then have several hours of sun-bath every day.

LOCAL REACTIONS.

One effect of the sun-bath is analgesia and this is most marked in lesions of the joints and abdominal cavity. Another phenomenon of local reaction, if the lesions be at all active, is that the affected part becomes tense and uncomfortable; the treatment should then be discontinued or an acutely painful reaction will occur. When a tuberculous joint or glands are exposed there is a swelling of the part affected and a similar phenomenon, though less easily demonstrable, occurs in the region of a deep-seated abscess. In the region of the lesion sensible perspiration occurs, while the parts around remain dry. A rise of temperature in the neighbourhood of the lesion is a constant occurrence. In a patient who is already pigmented there is a difference of colour in the neighbourhood of the lesion unless there is a sinus or operation wound, then a much darker pigmentation appears in the affected region. Dr. Rollier laid great stress on free drainage. Where there is suppuration gauze was used as a dressing. Sinuses heal up and bone sequestra come away under the influence of the sun treatment.

Those who are interested in the theory and practice of this important development of the vis medicatrix naturæ should study "Heliotherapy."[1] Dr. A. Rosselet, who contributes a valuable chapter on the scientific basis of heliotherapy, comes to the following conclusion:—

> "In heliotherapy, success must not be attributed solely to the action of light, as the quality of the air breathed, and of the nutrition absorbed, with rest, are also factors of great importance. On the other hand, it would be a mistake to look upon light as merely an adjunct to those other factors determining cure." Dr. Rosselet suggests that light may be absorbed by the blood, and "the energy given out by the radiations is stored and carried in the blood-stream to every part of the body; when liberated it stimulates the intracellular processes of oxidation and reduction."

Sir William Bayliss does not apparently accept this as a proven theory. No doubt there is an unusual metabolism of the body which fully accounts for the well-developed musculature in spite of the immobility, but the stimulus of sunlight on the sensory nerve-endings in the skin would tend to induce a uniform continuous reflex tonus in the muscle.

ATMOSPHERE OF CURE.

The general sense of well-being noticed in the patients may also be due to the "atmosphere of cure" inducing faith, hope, and patience to bear their lot. The bien-être thus induced plays a very important part in the recovery by promoting digestion, assimilation, and nutrition, also natural sleep. These necessary conditions for the storage of mental and bodily energy and for improving the natural defences of the body may be seriously interfered with by impatience, discontent, and anxiety which, by staying the flow of the appetite juices, interfere with digestion, assimilation, and nutrition. Again, insomnia and unrefreshing sleep—disturbed by dreams—occur where faith and hope are absent. Depressing drugs have to be administered to produce sleep and rest, and as a consequence there is a lowering of the store of vital energy. If the sun treatment is so successful in the cure of tuberculosis why, it may be asked, should it not be adopted for the prevention? Why not treat sick patients on open verandahs in the country where pure air and sunlight can be found? Why should chronic cases be kept in large expensively constructed buildings in our large towns and cities, when they can be so easily and comfortably transported to salubrious spots in the country? These are questions to which the Ministry of Health might well give attention. Before the war I visited some of the schools in Birmingham with Mrs. Pinsent and saw an open-air school for tuberculous children; I remarked then that the children looked healthier than the children in the normal schools. Would it not be better to have all schools so constructed as to obtain the greatest amount of sunshine and fresh air? Not until we can rid get of slums and back-to-back houses in our towns and cities, where the sunlight cannot enter, and house our poor people in proper dwellings will the reproach of rickets as an English disease be undeserved.

The establishment of an "atmosphere of cure" in sanatoriums largely depends upon the brain directing and presiding over the organisation and administration. Sense of discipline, morale, and self-respect form essentials for success. The value of occupation and amusement in establishing a sense of bien-être during convalescence cannot be over-estimated as a means of strenghtening the natural defences. My experience during the war showed me how important it was to get the neurasthenic or hysteric soldier to take up some outdoor occupation in which he had an interest. This one could do by not following the usual stereotyped army methods, but by telling the soldier whatever he grew in the garden he could have, or whatever he made in the workshop would be his own property to do what he liked with. The men asked to come and do work, and were not told to come. Again, I am a great believer in the value of music, especially choral singing, as a means of producing a *joie de vivre*.

APPETISING FOOD.

Another matter of importance in establishing contentment is enjoyment of food. Of course, the old adage "hunger is the best sauce" is true, but it is customary among nearly all civilised people to take three meals a day and the pangs of hunger are therefore seldom felt in hospitals, sanatoriums, or institutions for the treatment of the mental or bodily affected, yet how little attention is given by doctors, matrons, or others in authority to find out whether the patients and nurses have *appetising* food. Wholesome food can be made appetising without an increase of cost or labour, and physiological science and clinical observations have taught us that food made appetising by its savour and flavour has a psychic effect, starting a flow of the digestive juices before the food enters the mouth. This anticipatory psychic effect is essential for the enjoyment of food, and it is not sufficiently realised what an important part the enjoyment of food plays in the production of a

contented mind. Again, nothing is more conducive to discontent than when unappetising food is made more unappetising by monotony, and when the daily unappetising diet becomes a subject of contemplation. It is not only the morale and spirits of patients which suffer, but the nurses may be found affected upon particular days by contemplation of an especially unappetising meal. Again, I think that doctors and nurses should know how wholesome invalid diets are to be prepared, and how they can be made appetising without being in the least degree made unwholesome. The palate (if it is not vitiated) is a very good guide, and Voltaire was keen enough to appreciate the fact that experience tells one what is good for us and what we can digest. Now, an important matter in the establishment of an "atmosphere of cure" is the well-being, mental and physical, of the nurses. Too often they are overworked, badly paid, and indifferently fed and housed. Nothing but love for their work and hope for better things can then maintain morale, discipline, and that sympathy so essential for the well-being of the patients under their care.

SLEEP.

Sleep is a normal condition of the body occurring periodically in which there is a lessening of vital activity of all the organs of the body. But inasmuch as all vital active processes in the human body are dependent upon oxidation processes, it must be inferred that during sleep there is a diminution of processes of oxidation, as a result of which the body lies quiet with the muscles relaxed, the pulse-rate diminished, the respirations less frequent, and the person does not react to slight sensory stimuli. Secretions are less actively carried on, intestinal peristalsis is diminished, and the pupils are contracted. But the greatest effect is upon the highest level of the nervous system leading to a greater or less degree of unconsciousness. The lower subconscious and the bulbo-spinal autonomic levels are also affected but to a much less degree. It is probable that the whole of the bodily phenomena of sleep are due to a lessening of the oxidation processes at the neuronic synaptic junctions in the central nervous system, so that in deep sleep only strong stimuli or summation of stimuli can pass the synapse and result in a reaction. The waking state is associated with an awareness of alterations of the feeling continuum which is streaming in by all the sensory avenues, and this exæsthesia is integrated with the cœnæsthesia of states of feeling arising from the bones, joints, tendons, muscles, and labyrinth, the glands, and viscera.

The physiological explanation of sleep has never been satisfactory, and there is much to be said in favour of a biological explanation. Throughout organic nature there has been an association between functional activity and sunlight. Throughout the animal kingdom oxidation processes are fundamental to tissue-activity and discharge of energy under the influence of stimuli from the external world resulting in the production of fatigue products and a degree of exhaustion of potential energy which is capable of recuperation by rest. The normal conditions of sunlight and oxidation processes have been habitually juxtaposed in the evolution of the animal kingdom. While at the end of the day till dawn there is a lowering of oxidation processes in response to absence of environmental stimuli, there is a storage of potential energy. The fall in potential energy at the end of the day has in the long procession of ages been associated with a desire for sleep. This manifests itself especially by an inability to keep the eyes open and there is a feeling of fatigue in the elevators of the eyelids which tend continually to droop and shut out the light. R. Semon has shown that habit and memory are based upon the same fundamental principles. When two conditions are juxtaposed in time and place either one will revive the other. Thus if we represent C as sleep, A as night, B as a fall of potential energy and fatigue, sleep is induced habitually by either A or B. Probably B is the more important factor in determining the desire for sleep. Consequently when persons have to work by night and sleep in the daytime, they experience a fall of potential energy at the dawn and a desire for sleep in the day. We must look upon sleepiness occurring not because there is an actual exhaustion of the brain, but in order that it may not be reduced to that extremity. Every normal child, like the adult but in a less degree, possesses a store of nervous and muscular energy over and above that which it requires in ordinary conditions of life; and this statement is borne out by all the known facts, experimental and otherwise, concerning mental and bodily fatigue. The reserve energy certainly varies in amount in different individuals; it is intended only for emergencies and should not be habitually drawn upon. The sense of fatigue and the desire for sleep may be regarded as the protective and the instinctive guardians of this reserve of nervous energy. Both give warning that the reserve is about to be drawn upon, and if the warning is continually allowed to pass unheeded, exhaustion of the highest inhibitory function of the brain cortex ensues, and associative memory thus left unchecked, permits a continuous flow of ideas, resulting in mental excitement and sleeplessness. A vicious circle tends thus to become installed which, if not broken, leads to bankruptcy of nervous potential, with permanent mental irritability and lack of mental energy. A neurasthenic condition, with insomnia, is very prevalent now in highly civilised communities among young adults owing to over-pressure at school and college in competitive examinations; and quite young children of a nervous temperament, owing to parental indiscretion in their upbringing, may suffer from it. Sleeplessness of the child is a sign of nervous irritability and exhaustion, and requires careful attention lest worse evils follow. Darkness, stillness of the body, and silence favour sleep by removing the principal cause of wakefulness and activity of the mind. Habit fortunately permits sleep under the most unfavourable conditions; still, the sleep of young children must necessarily be a broken one in the single-room tenement dwellings of the poor of our large cities. This is an important unhygienic condition relating to mental development; for insufficiency of rest to the brain tends to failure of mental energy. The growing infant requires plenty of sleep; so does the growing child, and especially so when the child is suffering from bodily ill-health or nervous irritability.

I observed that neurasthenic officers and soldiers at the Maudsley Neurological Clearing Hospital during the war suffered with terrifying dreams, and all the while they lasted sleep was unrefreshing. Many neurasthenics could not recollect their dreams, but the fact that they awoke feeling less refreshed than when they went to bed indicated that they had not recuperated their nervous energy. Indeed, most neurasthenics will tell you that as the day goes on they feel better. During the battles of the Somme a considerable percentage of neurasthenic cases were sent back to England soon after they had left the battlefield. Many of them showed the aspect of fear with exophthalmia, von Graefe sign, fine tremors, and high blood pressure. These signs and symptoms persisted all the while the terrifying dreams persisted. It was probable there was an increased functional activity of the adrenal and thyroid glands in response to the emotion of fear.

I will now pass on to a brief reference to the constitution in relation to the reproductive and endocrine systems.

CONSTITUTION IN RELATION TO THE REPRODUCTIVE AND ENDOCRINE SYSTEMS.

What can change the constitution? Nothing, said Voltaire. The natural defences of the body against injury and disease are intimately bound up with and dependent upon the biochemical conditions of the blood, and the interrelation and harmonious interaction of functions of all the organs of the body by chemical messengers, especially those products of secretion of ductless glands. The fathers of medicine were accustomed to speak of the brain, the heart, and

the lungs as the tripod of life. We now know that certain ductless glands—e.g., the parathyroid, adrenal, and pituitary glands—are also essential for life. The *élan vital, joie de vivre* of youth is connected with the maturation of the sex organs and the passage into the blood of a hormone which determines the secondary sexual characters and produces a complete mental revolution in youth and maid. A new instinct, the love instinct, with its sentiments and passions is aroused which energises all the organs of the body. In pregnancy there are observable structural and functional changes in the thyroid, the adrenal, and the pituitary glands. Preservation of the species under natural conditions by reproduction denotes a sufficient vital energy for self-preservation with a balance still in hand for propagation. A good animality under proper control generally indicates a good constitution and powers of vital resistance against injury and disease.

For many years past I have been studying the reproductive and endocrine glands in over 100 patients dying in hospitals and asylums, and I have come to the conclusion that certain forms of insanity are associated with a tendency to an inborn deficiency of the reproductive and endocrine systems of glands, and that some of the symptoms can be correlated with a primary regressive atrophy of these organs. There is a progressive atrophy of both the spermatogenic cells and the cells of the interstitial gland of the testis. In a considerable proportion of these cases of insanity atrophic changes of variable degree occur in the thyroid, pituitary, and adrenal glands, and it is probable that other organs such as the liver and the cells of Langerhans of the pancreas and the parathyroids would show histological changes, but I have not yet examined these organs. However, a comparative examination of the reproductive organs and the thyroid, adrenal, and pituitary glands of the cases of primary dementia whether commencing in pre-adolescence, at adolescence, or post-adolescence, compared with the same organs of an acquired mental disease, general paralysis due either to congenital or acquired syphilis, has shown that the former are inborn. For whereas pronounced histological changes from the normal were usually found in the glands of the former, as a general rule, the glands of the general paralytic showed but little departure from the normal, indeed, less than in cases dying of tuberculosis in consumption hospitals. The symptoms of the primary dementia are probably associated with and dependent upon two causes: (1) The failure of oxidative processes in the whole body due to lack of the energising influence of the ductless glands causing suppression of functions and varying states of disintegration of the psychic unity with emotional indifference. (2) Progressive pathological changes in the nucleus of the cortical cells and increase of neuroglia cells proportional to the degree of dementia. This would lead to suppression of function; whereas symptoms due to the first-named causes are capable of improvement and even disappearance with restoration of functions, the latter are irremediable.

It is legitimate to associate the low blood pressure, acrocyanosis, and katatonic stupor with a deficiency of adrenalin and failure of function of the adrenal medulla. Then a return of function of this gland might result and account for the fact that katatonic stupor may pass off and a sudden impulsive behaviour arise, or a return to a fairly normal state may in some cases happen. In the study of sections of the adrenal gland I have been particularly struck with the good development of both cortex and medulla in general paralysis as compared with the primary dementia cases. Again, I have noticed that in all cases that died of septic poisoning, and in some few cases of tuberculosis with secondary pyogenic microbial infection, the whole or nearly the whole of the lipoid content contained in the cells of the cortex has disappeared. There is reason to believe that this substance is a source of the antitoxins; some authorities, indeed, speak of this portion of the gland as antitoxic and the medulla as angiotonic. The cortex, however, has many other important vital functions especially in connexion with reproduction; not only is it of vital necessity therefore for the preservation of the species but by the production of antitoxins it is essential for the preservation of the individual against microbial poisons.

OPOTHERAPY.

I have not time to develop the subject further than to say that there is reason to believe that the vis medicatrix naturæ largely depends upon a good constitution and that a good constitution implies a proper development of the reproductive organs and the ductless glands and their harmonious interrelation. Rudyard Kipling, in a very interesting speech at the Hunterian dinner, said that the God Brahm had hidden the mystery of the man in his own body. Astrologers, alchemists, and philosophers have sought for it outside the body, and until recently psychologists had sought for it only in man's organ of intellect and reason. We are coming more and more to realise that feeling depends for its vital urge, *libido*, or *élan vital*, upon the endocrine and reproductive systems which minister to the primal instincts of self-preservation and propagation through the old involuntary nervous system. Although long hidden and overlaid by the voluntary system, its fundamental importance in relation to human character and behaviour is beginning to be recognised. Only a corner of the veil that hides the mystery of life has been raised. I cannot do better than to quote the opinion of Cannon who has done so much to advance our knowledge:—

> The known influences of these glands are so striking and so important for the welfare of the individual and the race that most naturally hope has been stirred and imagination excited to a remarkable degree. Prophets have arisen who are proclaiming a new gospel. A flare of extravagant fancy is now blazing; all the mysteries of medicine are now to be accounted for in terms of disturbed internal secretion.

When we take a careful account of our present actual knowledge we find large gaps in it; though we talk glibly of the products of these organs, only two effective substances have been isolated and analysed chemically, adrenin and thyroxin. The claims of opotherapy have been largely based upon the undoubted remarkable effects of thyroid gland obtained in myxœdema and cretinism, and recently of insulin in diabetes. Further, despite the assurance of enthusiasts we are lacking really reliable tests for disturbances in many of the endocrine glands.

Medical science is becoming more and more dependent upon natural science in its widest sense. The knowledge that an essential element of thyroxin is iodine led to the discovery that districts in Switzerland and America where goitre was prevalent was due to the insufficiency of iodine in the food and water. For it was found that the administration of small quantities of iodine or a salt of iodine led to the disappearance of this disease of the thyroid gland in the district.

I have only lightly touched upon this subject of constitution in relation to endocrine glands and the *vis medicatrix naturæ*, but I should here remark that Dr. Rollier told me that where he could feel a good thyroid development he gave a good prognosis. I would also call attention to the fact that the majority of cases of primary dementia (dementia præcox) showing regressive atrophy of the reproductive and endocrine glands die of pulmonary tuberculosis with usually secondary microbial infection. This is an indication of a low vital resistance. Cases dying in consumptive hospitals do not show such pronounced changes in the reproductive and endocrine glands as cases of dementia præcox that die from sudden death or acute disease; so that although an exhausting disease such as tuberculosis—especially where there is secondary microbial infection—is a drain on these natural defences, it does not cause the same amount of exhaustion of internal secretions as this primary genetic deficiency (dementia præcox).

Our aim as doctors should be to assist Nature's defences as far as possible, to study the advances in the knowledge of the physiological action of drugs, and the physiology of the human body.

A Post-Graduate Lecture
ON
INTRACRANIAL TUMOURS.

Recently delivered for the Fellowship of Medicine at the Royal Society of Medicine

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IT is customary to include under the term "intracranial tumours" a large number of conditions which have little in common besides the slow and localised character of their development. Cysts, granulomata, chronic abscesses, and true neoplasms have all to be considered, and their inclusion is natural, since the symptoms to which they give rise are almost entirely the effect of their position and their bulk, and only by indirect inference can we conjecture their character. I propose first to touch very briefly on the tumours themselves and the conditions under which they occur, next to discuss the general symptoms to which they give rise, and then to pass on to a more detailed discussion of tumours in sites accessible to surgery.

VARIETIES OF TUMOUR.

From the standpoint of the surgeon the simplest tumours are the cysts, for mere removal of the fluid will at least relieve the symptoms and may result in a permanent cure. The most important practically are those due to trauma, and those resulting from the degeneration of a glioma. Traumatic cysts arise as the result of subdural or intracerebral hæmorrhage. Their origin may date to a severe moulding of the head during labour, with a probable laceration of the dural septa, but they are a not uncommon result of accidents, sometimes of quite a trivial nature. In both cases they may remain latent for years and may then without any apparent reason commence to enlarge, producing all the symptoms of a tumour.

In a gliomatous cyst the tumour tissue may almost entirely disappear, and may even on microscopic examination be very difficult to discover. But such cysts have a strong tendency to recur, although evacuation of the cyst and the treatment of its wall by fixing reagents has in some cases resulted in long periods of relief.

Of the granulomata, those due to tubercle are the commonest intracranial tumours of childhood, whilst after 20 they are rare. They usually occur in the cerebellum and may waken to activity after a long period of latency. After a period of activity they may again recede, sometimes, unfortunately, after sight has been destroyed by the pressure they have induced. They are often associated with some degree of meningitis, and the production of a diffuse infection is one of the grave risks of their removal, unless indeed they are so substantially encapsuled as to allow of total enucleation.

Intracranial syphilis, on the other hand, is a disease of adult life. It primarily affects the meninges, especially at the base, but it may result in the production of localised tumours, the frequency of which has, however, been somewhat exaggerated by the optimism of physicians. Unless the case is quite definitely one of cerebral syphilis, a positive Wassermann reaction is no excuse for delay in exploration, when the symptoms suggest the presence of a tumour.

Around a chronic abscess there may be formed a wall so dense that even on exploration an actual tumour may be diagnosed. Such abscesses may result from tubercle, or from pyogenic organisms which have reached the brain from local bone infections, especially of the ear, or from such septic conditions of the lungs as bronchiectasis and pulmonary abscess. Every endeavour must be made to remove such an abscess en masse, for opening the abscess, even if followed by drainage, will almost invariably result in a diffuse and fatal infection.

Of true neoplasms we have four groups to consider. From the auditory nerve arise the fibromata which form the characteristic tumours of the cerebello-pontine angle, as fascinating in diagnosis as they are baffling in removal. Rarely exceeding a hazel nut in size, they produce symptoms out of all proportion to their size, whilst nothing could be easier than their total removal were it not that it almost invariably costs the life of the patient. Only in tiny fragments and by slow degrees can they be successfully extirpated.

From the meninges arise the endotheliomata, the one great hope of the cerebral surgeon. They usually arise from the dura of the anterior vault, probably from the lacunæ of the superior longitudinal sinus. They may grow to a considerable size, and though they compress it they never invade the brain. On the other hand, they may invade the skull in a remarkable manner, stimulating bony growth and leading to the formation of external bony tumours. They are easily removed, they do not tend to recur, and after their removal the compressed brain may in many cases regain completely its lost function.

From the brain itself only the gliomata are known certainly to arise. They may be diffuse and infiltrate the brain till all demarcation is lost, or they may be so far encapsuled as to resemble endotheliomata, or, as already stated, they may form degeneration cysts. They never invade non-neural tissues, but from the brain itself they can never be extirpated, and they always tend to recur. They are the true malignant tumours of the brain, though only to the brain itself are they malignant.

Finally, within the cranial cavity we may find secondary tumours arising from carcinoma, melanotic sarcoma, and other growths in other regions of the body. They are only to be diagnosed in order to be avoided.

GENERAL SYMPTOMS.

As I have already said, these tumours have little in common besides the slowness of their growth, the localised character of their development, and the similarity of the symptoms which they produce. These symptoms may be conveniently considered under three groups: General symptoms, due to interference with the brain as a whole; regional, due to interference with some special region of the brain; and local, due to interference with local nerves.

These symptoms are not directly dependent on the position of the tumour, and are essentially due to the increase in intracranial pressure which it produces. Indirectly, however, the position of the tumour is of vital importance in their production. To mere bulk the brain shows great powers of accommodation, and nothing is more astonishing than the gigantic size to which a tumour may grow unnoticed, on one condition only, that it does not interfere with the flow of cerebro-spinal fluid. Continuously secreted by the choroid plexuses in the lateral ventricles, this fluid flows through the foramina of Monro to the third ventricle, whence it is conveyed by the aqueduct of Sylvius to the fourth ventricle, escaping by the foramina of Luschka and Magendie into the subarachnoid space, to be finally discharged by the Pacchionian bodies into the superior longitudinal sinus. A tumour involving the cerebral hemispheres may grow to a huge size without affecting this vital circulation. On the other hand, in the interpeduncular space, in the corpora quadrigemina, or at any point below the tentorium, even a small tumour may obstruct the flow, and, by producing a secondary hydrocephalus, may cause a sharp rise in the intracranial pressure, and with it general symptoms of the greatest severity. The contrast between supra- and infra-tentorial tumours is very largely due to this consideration alone. Above the tentorium the general symptoms are mild and surgery is comparatively easy; below the conditions are always critical, and surgical interference will only too often be fatal. By the secondary hydrocephalus the cerebellum is forced down through the foramen magnum till it forms a cone which may reach as low

as the third cervical lamina, crushing beneath it the medulla and the vital centres which it contains.

These general symptoms include the classical symptoms of intracranial pressure, headache, vomiting, and papilloedema. I would insist, however, that only in a secondary sense are these the symptoms of an intracranial *tumour*, and that every effort should be made to effect a diagnosis before they arise. To wait for them is as unreasonable as to wait for acute intestinal obstruction before diagnosing a stricture of the colon. When, however, these classical symptoms occur they are of great importance and present very definite characters. The headache is constant, but with severe exacerbations. It is often severe on waking, and it is increased by anything which raises the intracranial pressure, such as exertion, excitement, or even stooping. Vomiting is also most marked on rising in the morning; it is independent of food, unaccompanied by abdominal pain, unpreceded by nausea, and therefore occurs as a sudden projectile act without warning. Papilloedema may be present in a severe degree before it becomes subjectively obvious to the patient in blurring of vision, but, as a rule, when it is at all marked, a careful examination of the visual fields will show some degree of contraction for colour and for small white objects. Transient attacks of blindness may occur, but persistent diminution of vision means that atrophy has commenced, and complete recovery of visual power is then impossible. The swelling of the disc may be accompanied by retinal hæmorrhages and is generally, though not always, most marked on the side of the lesion.

It should be noted that almost identical symptoms occur in renal disease, severe anæmia, and lead poisoning, when they are the result of cerebral œdema, which again produces an increase in the intracranial pressure. The exclusion of these conditions is, however, a simple matter. Among other general symptoms we should mention a progressive mental dullness, sometimes bordering on drowsiness, attacks of giddiness, not, however, of such sudden onset as those which occur in Ménière's disease and transient diplopia. The last may only occur once or twice and in the earliest stages, long before the onset of the classical triad of symptoms; it is very transient and may seem to the patient too trivial to mention. If, however, it really occurred it should be regarded as a symptom of the very first importance in the diagnosis of an intracranial tumour.

From this brief review of the general symptoms of intracranial tumours we must now pass on to a consideration of their regional effects. But before taking up in detail the effects of tumours in different regions let us first consider for a moment how these effects are produced. The mere pressure of a tumour on the actual cells of the brain would probably be entirely without result, were it not for the interference with the cerebral circulation by which this pressure must in practice be accompanied. It is a clearly established law of cerebral pathology, beautifully elaborated by Trotter, that congestion means irritation, and anæmia paralysis. Now the first effect of the pressure of a tumour must be interference with the venous return and congestion of the region of the brain concerned. If this happens to be the motor cortex the irritation may show itself in the production of Jacksonian fits, starting in that region of the body which the particular portion of the motor cortex supplies. As the tumour grows and the pressure increases the capillaries will be compressed, anæmia will be produced, and paralysis will replace the irritation. But as the tumour grows, in addition to an increase in the actual pressure at any one point, we have an extension of the area involved, so that in fact we shall have a spreading area of paralysis surrounded by a zone of irritation. And the whole effect is enhanced by the fact that every now and then an acute œdema may arise around the advancing tumour, increasing the general pressure and producing a dangerous exacerbation of the symptoms, sometimes the abrupt prelude of a fatal termination.

TUMOURS OF THE ROLANDIC AREA.

The most important portion of the cerebral cortex from the point of view of intracranial tumours is undoubtedly that which lies in front of the fissure of Rolando, the precentral or ascending convolution. It differs histologically from any other portion of the cortex, since here alone are found the clusters of giant pyramidal cells of Betz, from which arise the great pyramidal tracts. It is essentially the final area through which the volitional control of the brain is conveyed to the muscles. It originates nothing, but it transmits movement formulæ for the execution of various skilled acts, the formulæ themselves being prepared by the synthetic action of other centres—visual, auditory, sensory, or psychic. It has, in addition, the important function of inhibiting muscular tone, the muscles being thus held ready for instant response to the transmitted formulæ. Its destruction, therefore, leads to a loss of volitional control and to an increase in muscular tone which hampers useful action.

In this area the different portions of the body are represented by centres arranged in a very precise manner. At the extreme upper end commence the centres for the leg, the toes and ankle being represented actually on the mesial surface of the hemisphere. Passing downwards, the knee and hip are followed by the trunk, which lies just opposite the superior genu of the fissure. Below this come in order the shoulder, elbow, wrist, fingers, and thumb. Opposite the inferior genu is the neck, and immediately below this the face, the centre for the eyelids lying close to the centre for the thumb. The tongue and larynx follow. Just in front of the hand area is a special area for the control of the conjugate movements of the eyes and rotation of the head to the opposite side.

When a tumour affects this region it gives rise to symptoms, as I have already explained, by the interference with the circulation which it produces. When the pressure is slight and only congestion results, irritation is produced; when it is more severe we have anæmia and paralysis. And inasmuch as the tumour is steadily advancing, there will usually be a zone of paralysis surrounded by a zone of irritation. The phenomena of irritation in this region have a very characteristic form, first described by Hughlings Jackson and universally known as Jacksonian fits. The characteristics of these are that they start in a precise region of the body, always the same, and that they spread to other regions in a definite order, corresponding exactly to that in which the centres are arranged in the cortex. They may be preceded by twitching or tingling in the part, and they commence with a stage of tonic spasm, passing into a series of clonic jerks. Consciousness is only lost if the convulsions become generalised. The fits may occur at any interval, from months down to minutes, and a very important feature is that they are always followed by definite weakness in the portion of the body in which the fits started.

Cortical paralysis has equally striking features. It is essentially a paralysis of movements and not of individual muscles or even muscle groups. Stimulation of the centres in the motor cortex give rise to definite movements, such as flexion of the elbow or abduction of the arm, in each of which certain muscles contract with nicely balanced force, whilst other antagonistic muscles are relaxed in suitable degree. Destruction of the centre removes from the individual the power of initiating the movement concerned, and at the same time the removal of cortical inhibition and control compels the limb to take up a characteristic attitude. Thus, in a complete hemiplegia, where the whole cortical control is removed, the arm will take up a position of adduction, with flexed elbow, pronated forearm, and flexed wrist and fingers. The leg, on the other hand, will be adducted and extended at the hip, and extended at the knee and ankle. In partial lesions other attitudes may be adopted. In all cases the paralysis will be accompanied by an increase in tone in the muscles and by an increase in the deep reflexes.

The growth of a tumour pressing on the motor area will therefore give rise to a characteristic clinical picture, Jacksonian fits followed by weakness in the region of origin, and a steadily advancing paralysis. The latter spreads as before in accordance with the arrangement of the cortical centres, and thus presents certain peculiar features. It is not uncommon, for example, for the thumb centre to be first affected. In such a case a moment's consideration of the cortical plan will show why it is that the face may be affected before the shoulder, and that it will always be involved long before the leg. On the other hand, a lesion which starts in the toe area can only spread to the arm from the shoulder downwards, and not till the hand is involved can it reach the face.

There are other curious and distinctive features of a cortical lesion, depending on the fact that certain movements are not entirely under voluntary control and may be initiated from regions other than their proper centre in the contra-lateral precentral area. Thus it is typical of a cortical paralysis of the face that the frontalis and orbicularis palpebrarum should escape. This appears to be due to the fact that in general (and in some individuals invariably) these muscles act together on the two sides and have thus obtained a bilateral cortical control. Again, in a cortical paralysis of the face, though no voluntary movement of the lower part may be possible, it may be thrown into strong contraction on emotional disturbance, such as laughing. Neither of these phenomena could occur in a paralysis due to a lesion of the facial nerve itself, and they may thus be of great value in diagnosis. Similarly in cases where the trapezius is paralysed by a cortical tumour the upper portion can often be made to contract on deep respiration, a symmetrical though voluntary act.

Immediately in front of the precentral area lies the intermediate precentral area, in which it is probable that motion formulæ are constructed and retained and that the memory for skilled acts resides. Upon its integrity depends the accurate performance of actions which we have learned by practice to execute with facility, whilst its destruction, especially on the left side, may abolish the possibility of such acts, although there may be no paralysis in the ordinary sense. Such a condition is known as motor apraxia. By far the most important example is in lesions of the posterior extremity of the left inferior frontal convolution in right-handed individuals, the area of Broca, in which is stored the memory of those movements involved in speech. The loss of this area makes voluntary speech impossible, although the individual may know exactly the words he wishes to use and may be able to look them up in a dictionary. In the involvement of the area by a tumour these symptoms are diagnostic, but the area is of further importance to a surgeon, since whenever possible he will avoid its neighbourhood and will plan his explorations so as to leave it intact.

Immediately behind the fissure of Rolando lies the post-central area, second only in importance to the motor area itself. It is essentially a sensory area and in subdivisions and extent it corresponds exactly to the motor area in front of the fissure. From this, however, it is sharply differentiated by its histological structure, for the groups of Betz cells are absent and there is an additional granular layer. Sensory tracts may be traced from cell stations in the thalamus to terminations in this area, and it forms in fact the primary cortical receiving station for sensory impulses entering consciousness. The impulses reach this area in crude form, only capable of producing indiscriminate sensations, vague and badly localised. But it is here apparently that they cross the threshold of consciousness to be analysed, compared, and refined in other areas. Injury to this area may result in a loss of postural sense, of localisation, of tactile discrimination, of the perception of the degrees of heat and cold, and it is characteristic of such lesions that this loss should be irregular in its distribution and vary in the extent to which each element is affected. This peculiar sensory loss may be accompanied by a hypotonia of the muscles in the same region, due presumably to interference with the cortical reflex arc. Irritation produces a vague tingling in the corresponding area, and such a tingling is often the precursor of a Jacksonian fit commencing in that region of the body.

Just as in front of the motor area we have an area for the preparation of complex motor acts, so immediately behind the sensory area we find an area for the elaboration of sensory impressions, in which the crude impressions received by the sensory cortex are analysed, estimated, compared, and recorded. The highest portion of this area is devoted to stereognosis, and a lesion in this region may destroy the power of recognising objects by touch, of estimating form and weight, and of recognising the position of the limbs when blindfold. It is obvious that a tumour involving this region of the brain, causing paralysis at one point and irritation at another, may set up phenomena of great complexity and produce symptoms exceedingly difficult to unravel. But a further difficulty is added by the fact that the tumour may be either extra- or intra-cerebral, and that it may thus approach the cortex either from above or from below. Furthermore, the distinction is of the utmost importance to the surgeon, for in the first case the removal of the tumour may be easy, in the second it is probably impossible. The most important distinction is to be found in the order of onset of the symptoms. In cases where the tumour is cortical, symptoms of irritation will first appear, to be followed later by paralysis. In subcortical tumours the tracts are likely to be first involved and it may be only after a paralysis of some duration that signs of irritation become evident. But the distinction is by no means constant and there is no more difficult or uncertain point in cerebral surgery than the diagnosis between a cortical and a subcortical tumour.

Certain of these points are illustrated in the following cases :—

CASE 1.—A married woman, aged 25, was referred to me by Dr. R. A. Rowlands in October, 1921. For 18 months she had suffered from occasional morning headaches which had become more severe in the last two months, being now accompanied by vomiting. Seven weeks before I saw her she had an attack of numbness in the fingers of the left hand, spreading up the arm to the shoulder and also involving the left side of the tongue. She was unable to use the hand and had difficulty in speaking. The attack lasted three or four hours. Two days later a similar attack occurred, but lasted for a longer time, and a certain degree of numbness in the tips of the left index and middle fingers had persisted ever since. She was a healthy, well-developed woman, mentally alert. Her ocular movements were normal and her vision fair, but slightly blurred for distant objects. There was severe papillœdema of both discs and weakness of the lower portion of the left side of the face. The tongue was protruded to the left. Grip and wrist extension were weak on the left side, but all other movements were normal. On the left all the deep reflexes were increased, there was an upgoing toe, and the abdominal reflex was diminished. Sense of position was defective in the fingers and thumb of the left hand. A cortical tumour of the right Rolandic area was diagnosed.

Operation.—When an osteoplastic flap over the right Rolandic area was turned down, the dura was seen to be purplish in colour and under very great pressure. On opening it a large soft tumour appeared in the upper part of the aperture. A diffluent tumour about the size of a tennis ball and purplish in colour slowly oozed out. It was not attached to the brain in any way, and as it emerged the cavity in which it had lain became completely obliterated. The tumour appeared to have arisen from the inner surface of the dura, a considerable portion of which was removed with it. The osteoplastic flap was returned, no attempt being made to close the dura. The patient made a perfect recovery and has remained well ever since. Her sight is now normal and there is no trace of papillœdema.

CASE 2.—A girl, aged 12, was referred to me by Dr. Cecil Wall in January, 1922. For 15 months she had suffered from frontal headaches, accompanied by vomiting, and lasting about 24 hours. They were followed by a sensation of numbness in her left leg. Eight months ago the numbness became more marked, and there were occasional attacks of twitching in the leg, which later spread to the trunk, arm, and face on the left side. These attacks had now become frequent, occurring at intervals of one to six days, and always preceded by numbness in the left leg, starting in

REGIONS OF IMPORTANCE IN THE LOCALISATION OF INTRACRANIAL TUMOURS.

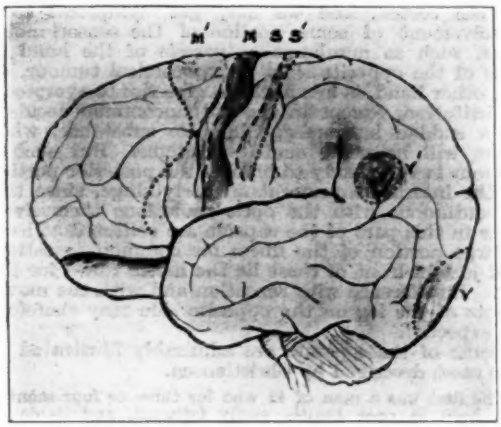

FIG. 1.—Cortex of the left cerebral hemisphere. M, Precentral area. Threshold of motor discharge. M', Intermediate precentral area. S, Postcentral area. Threshold of sensory reception. S', Intermediate postcentral area. V, Visual receptive area. V', Visual word memories.

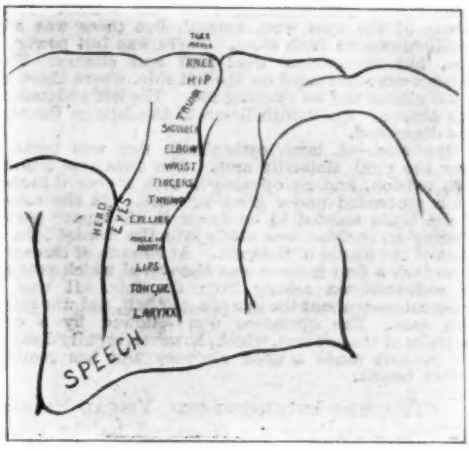

FIG. 2.—Detail of precentral area.

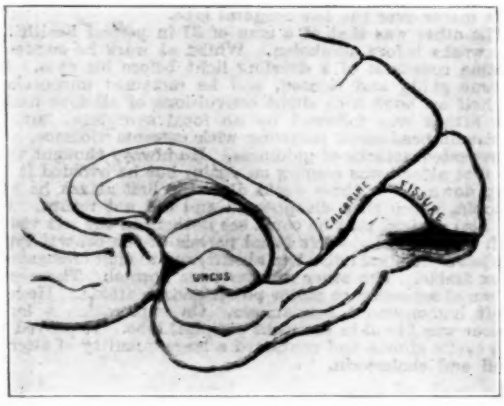

FIG. 3.—Temporal lobe and mesial aspect of occipital lobe.

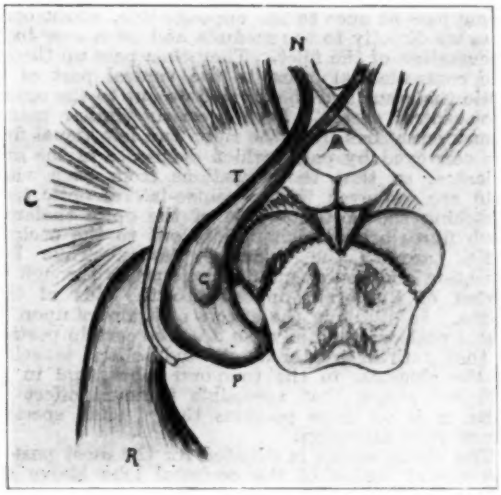

FIG. 4.—The visual path. N, Optic nerve. G, External geniculate body. R, Optic radiations. T, Optic tract. P, Pulvinar of optic thalamus. C, Internal capsule.

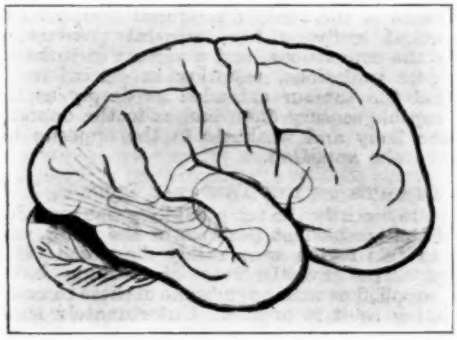

FIG. 5.—The optic radiations, showing their position in the temporal lobe and relation to lateral ventricle.

FIG. 6.—The optic chiasma from above. A, Normal. B, Distorted by pituitary tumour.

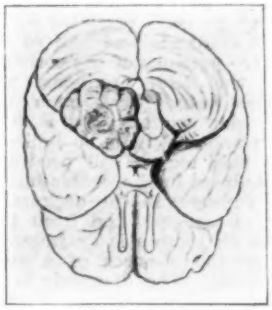

FIG. 7.—Acoustic tumour. Cruveilhier's case, after Cushing.

the toes. Since the onset of the numbness the headaches had practically disappeared. She was a well-nourished intelligent child, but dull and apathetic. She answered questions readily, but occasionally seemed to have some difficulty in understanding what was meant. The movements of the eyes were normal, but there was advanced papilloedema on both sides. There was full power in both legs, but movements were stiff and clumsy. The deep reflexes were increased on the left side, where there was also ankle clonus and an upgoing toe. The left abdominal reflex was absent. An endothelioma of the falx on the right side was diagnosed.

Operation.—A large osteoplastic flap was turned down over the right Rolandic area. The dura was found under high tension, and on opening it with a crucial incision the brain protruded under great pressure. As the consistency of the brain seemed to be firmer in the upper part of the opening an incision was made into the frontal lobe well in front of the fissure of Rolando. At a depth of three-quarters of an inch a firm tumour was discovered which proved to be an endothelioma arising from the falx. It was a firm spherical mass about the size of a golf ball, and was enucleated with ease. The operation was followed by a complete paralysis of the left arm, which, however, rapidly disappeared. The patient made a good recovery and has remained in perfect health.

TUMOURS INVOLVING THE VISUAL PATHS.

Visual sensations are conveyed to the cortex by paths so similar to those of somatic sensation that a comparison is both interesting and instructive. Sensory impulses from all parts of the body and of every kind enter the spinal cord by the posterior roots and are conveyed upwards in the various tracts. Some pass at once to the opposite side, whilst others pass up directly to the medulla and cross over in the decussation of the fillet. They then pass up through the contra-lateral crura to the ventral part of the optic thalamus and thence radiate out to the sensory post-central cortex. In a precisely similar manner visual sensations from the right and left visual fields are conveyed by paths which decussate in the optic chiasma, so that the sensations from each visual field are conveyed in the contra-lateral optic tract. Reaching the posterior pole of the optic thalamus, fresh fibres arise which radiate out to the occipital cortex around the calcarine fissure. Thus both sensation and vision enter consciousness through the cortex of the brain opposite to the side of their origin. In studying the effects of tumours upon the visual path we shall have to describe certain portions of that path in greater detail, and as it is especially at the chiasma, in the temporal lobes, and in the occipital region that accessible tumours affect the path, it is to these portions that I shall specially direct your attention.

The visual cortex is situated for the most part on the mesial aspect of the occipital lobe above and below the calcarine fissure. This fissure bears a precise relation to the visual fields, for below the fissure lies the receptive field for the lower half of the retina, above it for the upper. Thus an injury to the cortex below the fissure will affect the upper portion of the visual field, whilst the lower portion of the visual field is related to the upper cortical area. And as each occipital lobe is concerned only with the contra-lateral half of the visual field, injury to these portions of the cortex will affect only a quarter of the field, producing a quadrantic hemianopia. Such lesions have been described as the result of gunshot wounds, but it is rarely that the effects of a tumour will be so limited. In general, a tumour in this region will produce more or less complete blindness in the contra-lateral visual field.

Tumours in the occipital region may be intra- or extra-cerebral, and from the surgical point of view the distinction is an important one, as in the latter case the chances of a successful removal are far greater. The diagnosis is exceedingly difficult, but there are important considerations which may be of assistance. A cortical tumour is more likely to produce symptoms of irritation; never true pictures, for they are not stored here, but flashes of light, often coloured and suggesting fireworks. Those who are the subjects of migraine will be only too familiar with such visual effects, probably arising from vascular disturbances in the occipital cortex. As such a tumour spreads it will involve other regions of the cortex, and we may get symptoms from involvement of some portion of the sensori-motor area, such as numbness or paresis of the hand or face of the opposite side. A subcortical tumour, on the other hand, is less likely to give rise to symptoms of irritation, except in the not uncommon accident of a sudden hæmorrhage into its substance, when there will be other acute symptoms. But such a tumour is very likely to involve the posterior portion of the internal capsule at an early stage, since this is continuous with the optic radiations themselves. Now in this part of the capsule are collected at least a large portion of the fibres for common sensation, and just in front of these lie the motor fibres for the leg. Interference with sensation and with the movements of the leg on the opposite side may therefore be expected.

Some of these points are admirably illustrated in two cases described by Christiansen.

The first was a man of 41 who for three or four months had been in poor health, easily fatigued, and liable to occasional attacks of shivering. For two months he had had headaches, occipital and frontal, coming on with great violence, often at night, and accompanied by such giddiness that he once fell down. His memory had become poor. The man seemed very ill, his gait was uncertain and slightly reeling, but there was no definite incoördination nor changes in the reflexes nor in sensation. He had a definite right homonymous hemianopia. A few days later there was a slight weakness of the right face, followed in a short time by weakness of the right upper limb and early papilloedema. On exploration a large tumour was found arising from the dura mater over the left occipital lobe.

The other was that of a man of 37 in perfect health till five weeks before admission. Whilst at work he suddenly became conscious of a dazzling light before his eyes. He became giddy and fainted, and he remained unconscious for half an hour with slight convulsions of all four limbs. The attack was followed by no focal symptom, but by persistent headaches, recurring with extreme violence, and by repeated attacks of giddiness. He always thought that the first attack was coming on again, but he avoided it by lying down. For three weeks after the first attack he had diplopia, which then disappeared and did not return. He had also noticed that he could see nothing in the left visual field. He had slight left facial paresis of the central type. The left abdominal reflex was absent, and the left cremasteric reflex feeble. The other reflexes were normal. There was no loss of sensation or motor power and no ataxia. He had a left homonymous hemianopia. On exploration a large tumour was found in the right occipital lobe. It proved to be a cystic glioma and contained a large quantity of altered blood and cholesterin.

In each of these cases a large tumour developed silently. In the first it gradually gave rise to signs of general pressure, headache, and giddiness, but only at a late stage did signs of regional pressure appear. From that moment, however, they were progressive, spreading over the cortex till even the Rolandic area was affected, and hemianopia was followed by weakness in the right face and arm. In the second no symptoms arose until a sudden hæmorrhage into the substance of the tumour produced symptoms of acute cortical irritation from general pressure as shown by the convulsions, and a violent disturbance of the optic radiations, resulting in sensations of light. Had the tumour extended as deeply as the internal capsule sensory disturbances in the opposite half of the body and weakness in the opposite leg would have also appeared.

TUMOURS OF THE TEMPORAL LOBE.

Until quite recently the temporal lobe was regarded as one of the most silent portions of the brain, and tumours in this region were rarely diagnosed till a late stage. The investigations of Cushing have, however, supplied us with a syndrome of these tumours as fascinating as it is precise. Unfortunately these cases rarely present themselves till general symptoms have appeared, to mask the essential features of the syndrome. It was shown by Mayer in 1907 that the optic fibres which arise from the posterior

extremity of the optic thalamus pursue a very definite course and maintain a very precise arrangement as they spread out to form the optic radiations, to end in the occipital cortex. Starting in an outward direction they flow over and around the descending horn of the lateral ventricle, passing backwards on its outer and inferior aspects. The ventral fibres thus make a long detour, whilst the dorsal reach the cortex by a shorter route, but the important point is that the two groups maintain their individuality, the ventral fibres conveying impressions from the lower portions of the retinæ and terminating below the calcarine fissure, whilst the dorsal fibres convey impressions from the upper portions of the retinæ and terminate above that fissure. But we have seen that each side of the brain is only concerned with the contra-lateral visual field. It follows that a tumour affecting the ventral part of the right temporal lobe may produce blindness in the upper left field, whilst a tumour affecting the dorsal part of the same lobe may produce blindness in the lower left field.

In the early stages, however, these defects may be only partial and can only be discovered by very accurate and minute perimetry. With the ordinary rough methods they are certain to be missed, and for this reason they have escaped notice. In later stages and with tumours far back the whole radiation will be involved and a complete hemianopia will result. If, on the other hand, the tumour is in the anterior part of the lobe the radiations may entirely escape. But even with these qualifications the sign is of the utmost value in fixing the site of a tumour hitherto obscure, and Cushing succeeded in demonstrating it in 25 out of 59 verified tumours of the temporal lobe.

The temporal syndrome includes another symptom of equal interest, occurring in those cases where a tumour affects the region of the uncus. It is a peculiar attack, lasting for a few seconds and possibly recurring many times a day. In it the patient feels dizzy, or even passes for a moment into a dreamy state, in which he may have hallucinations of smell, taste, hearing, or vision. The first two may be agreeable and may suggest scents or fruit, or intensely disgusting, in which case sucking movements of the lips and tongue may occur. The hallucinations of vision may be very extraordinary, such as a procession of black cats across the ceiling, or a little negress cooking. Occasionally a complicated scene is enacted. In any case the hallucination is always the same; it always occurs in the blind field, and it always disappears in this direction when any attempt is made to follow it. The essential symptoms of a temporal tumour are thus a quadrantic hemianopia and a form of petit mal, accompanied by peculiar hallucinations of smell, taste, or sight.

PITUITARY TUMOURS.

An entirely different type of hemianopia may be produced by tumours arising from the pituitary gland. This small gland lies immediately behind and below the optic chiasma, from which under normal conditions it is separated by the olivary eminence of the sphenoid bone. When, however, it is replaced by a tumour, this may produce a pressure before which not only the olivary eminence but the anterior clinoid processes may themselves disappear, whilst the tumour pushes forwards beneath the optic chiasma, lifting it up and stretching the optic nerves in a very remarkable manner. The pressure falls chiefly on the posterior and inferior portion of the chiasma, the precise part in which the fibres from the nasal portions of the retinæ decussate. The interference with these fibres results in blindness in the temporal fields on both sides, and we thus see how it is that *bitemporal* hemianopia is such a characteristic feature of tumours of the pituitary gland.

Occasionally the tumour may push the chiasma up in such a way as to compress its margins against the internal carotid arteries and a binasal hemianopia may result. But this is a rare occurrence. If, however, the tumour is left to grow the combined pressure on the chiasma and traction on the optic nerves will produce total blindness. Whether total or partial the blindness is accompanied by atrophy of the nerve, and the pale, shrunken disc is in striking contrast to the congested, swollen structure seen in the papillœdema which is so common a feature with other varieties of cerebral tumour.

With pituitary tumours the pressure effects are very localised, and we rarely find any indications of increase in the general intracranial pressure. From pressure on the floor of the third ventricle we may get somnolence and polyuria. Pressure on the uncus may give rise to typical uncinate fits, with the transient dreamy state and hallucinations of taste and smell. Paræsthesias in the face may arise from pressure on the fifth nerve or ocular palsies from the third. Headaches may occur, it is true, but they have a bursting character, are not accompanied by vomiting, and appear to be due to tension within the pituitary fossa, the absorption of whose walls can be readily demonstrated in an X ray photograph.

In a majority of cases pituitary tumours give rise to an entirely different group of symptoms from excess or defect in secretion. The gland consists of two portions, an anterior and a posterior lobe, each producing a secretion of vital importance, the excess or defect of which may give rise to phenomena of great complexity. Very briefly the results are as follows. Excess in the anterior lobe produces gigantism when it commences in childhood, acromegaly when it commences in adult life. Defect produces Lorraine's type of infantilism, with small body, small fine bones, asthenia, and loss of sexual characters. In the posterior lobe excess produces a high blood pressure, an excessively alert intelligence, and possibly glycosuria, whilst defect causes Fröhlich's syndrome, with excessive deposit of fat, loss of sexual characters, dull mentality, and high sugar tolerance. But even these complex syndromes rarely occur in a pure form, and the case may pass from one to another with the development of the disease.

ACOUSTIC TUMOURS.

All the tumours to which I have so far referred lie above the tentorium; as I have already mentioned, those which lie below it have very special characters to which I now wish to draw your attention. Of these tumours one of the most characteristic and important is that of the acoustic nerve. A small fibrous tumour of slow growth, it gives rise to symptoms out of all proportion to its size, whilst its removal will tax to the utmost the resources of the surgeon. These tumours are a peculiarity of the acoustic nerve, other nerves being similarly affected with extreme rarity. Their importance will be recognised from the facts that they form 6 per cent. of all intracranial tumours, that the injury they produce is purely mechanical, and that their successful removal means the complete and permanent cure of a patient who is otherwise doomed to blindness and a terrible death.

The first symptom is naturally unilateral nerve-deafness, often first noticed in using the telephone, and this may precede all other symptoms by many years. The vestibular portion of the nerve may also be affected at an early date, and giddiness may result. It is not, however, until a later stage, when the cerebellum is itself involved, that ataxia and vertigo become prominent symptoms. When they do occur they are accompanied by weakness of the lower extremity on the side of the lesion, with unsteadiness of gait and a tendency to fall to this side, and by a nystagmus with slow oscillations on looking towards the lesion. Soreness and stiffness of the neck are early features and may be due to stretching of the tentorium. Neighbouring nerves may be pressed upon or stretched, and we may find weakness of this side of the face or of the external rectus of the eye, or tingling in the distribution of the fifth nerve, with lowering of the corneal and palate reflexes on the same side. It is characteristic that all these effects should vary from time to time, whilst the deafness remains invariable.

But interesting as these symptoms are, they are trivial as compared with the general symptoms which arise as soon as the distortion of the pons has produced occlusion of the aqueduct of Sylvius and obstruction to the outflow of cerebro-spinal fluid from the ventricles. Headache, vomiting, dulling of the mental powers, and loss of vision from papillœdema may come on with a precipitancy comparable to that of the symptoms of acute intestinal obstruction, and the case may pass in a few days from one of academic interest to one of desperate emergency. The tumour actually lies in the lateral cistern of the arachnoid and is surrounded by a localised collection of fluid, a slight increase in which may at any moment determine the disaster. The pons is distorted, the aqueduct is blocked, the lateral ventricles become distended and force down the mid-brain, and the tentorium with the structures beneath it, so that the cerebellum may be driven into the spinal canal as far as the third cervical lamina, and the medulla be crushed with its vital centres.

No tumours show in sharper contrast local, regional, and general symptoms, and it is in this order that they appear. First we have the nerve-deafness of the eighth, and then the transient palsies of the seventh, sixth, and fifth nerves. Next the cerebellum is compressed and instability of gait, vertigo, and nystagmus appear. Finally, obstruction occurs and this small tumour produces all the classical symptoms of intracranial tension, headache, vomiting, and papillœdema, in an aggravated form. I have chosen it as a closing example as an epitome of the surgical pathology of cerebral tumours.

OPERATIVE TREATMENT.

A discussion of the details of operations on cerebral tumours would open too wide a field, but there is one point to which I should like to refer—namely, the use of local anæsthesia for these operations. The method is not yet in general use, but so remarkable are its advantages that I venture to think that its universal adoption can only be a matter of time. It is a very conservative statement to say that its use reduces by half the dangers and the difficulties of the surgery of the brain and spinal cord. The reasons for this will be made clear by an illustration.

CASE 3.—A man, aged 44, had suffered for some months from a steadily advancing paralysis affecting primarily the right leg, but spreading to the right arm and face, and interfering with speech. The diagnosis was made of a glioma of the left frontal lobe. Without warning he had a severe fit in which he lost consciousness and had general convulsions. This was followed by a marked increase in the spasticity and paralysis of the right side, complete loss of speech, complete paralysis of the lower face and tongue, and difficulty in swallowing. The man was very ill, but it was felt that some effort ought to be made to relieve him.

Operation.—After a preliminary injection of morphia gr. $\frac{1}{4}$ and hyoscine gr. $\frac{1}{150}$, the area of operation was anæsthetised by means of a 1 per cent. solution of novocaine, to which a small amount of adrenalin had been added. The line of incision, extending in a curve from the eyebrow to the mastoid process on the left side, was first infiltrated, then the injection was carried beneath the epicranial aponeurosis, and finally a deep injection was made into the left temporal fossa. About 100 c.cm. of solution were used. Half an hour later a very large osteoplastic flap was turned down, including the greater part of the left fronto-parietal region, four large trephine holes being joined by means of a Gigli saw. The dura was divided and a large area of brain exposed. The left frontal lobe was found to be very extensively involved by a glioma, the deeper portion of which had become cystic and had ruptured into the lateral ventricle, from which 30 c.cm. of turbid fluid full of débris were aspirated. As the brain was now under no pressure the osteoplastic flap was returned and the scalp sutured in the usual way. Throughout the whole operation the patient felt absolutely nothing, and, in fact, for the greater part of the time he was quietly asleep. Six small gauze swabs were used and one ligature (for the supraorbital artery), and the total loss of blood could not have been half an ounce. The only change was a slight quickening of the pulse-rate, which at the end of an extensive exploration lasting 50 minutes was 120, and of good volume. The patient made a steady improvement and in three weeks was almost as well as before the rupture of the cyst, walking with a little help and recovering his speech.

With local anæsthesia operations on the brain and spinal cord are practically bloodless, there is little or no shock, and the risk of respiratory troubles after the operations is minimised. During the operation there is no increase in vascularity or in intracranial pressure, such as are inevitable with general anæsthesia. The anæsthesia of the bone and of the dura appears to be absolute. The operation is conducted under conditions so ideal that, except to allow time for the extrusion of a tumour, there can rarely be any need for a two-stage procedure. The comfort of the patient afterwards is remarkable, and the attention he requires is greatly reduced. I believe that the use of local anæsthesia marks a very real advance in the surgery of the brain and spinal cord, and nowhere are its powers more remarkable or its advantages more apparent than in operations upon intracranial tumours.

A NOTE ON
MECHANICAL APEX TRACINGS.

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AT the beginning of 1923, when attending the course of cardiology at the National Hospital for Diseases of the Heart, London, I was much struck with the difference of opinion which exists with regard to mechanical apex tracings or cardiograms in France and England. I have thought, therefore, that it would be of interest to discuss the reasons why we, in France, consider that mechanical cardiography possesses a wide field of information and is of great symptomatological importance. It is not my intention in this article to compare mechanical cardiography with electrocardiography. The subject is too large and lies without the scope of the present paper. I would like to state that each has its importance and its place in cardiology and that the one supplements the other and can in no sense take its place.

As shown by Pachon [1] in 1904, the apical tracing reproduces in an exact and faithful manner the curve of intraventricular pressure oscillations during the cardiac cycle. But, in order that this tracing may be compared or identified with the admirable curves obtained from large animals, such as the horse, by Marey and Chauveau [2] with intracardiac "sounds" or sounding pipes, by Hürtle with an elastic manometer, and by Piper with an optical pressure recorder, there is one essential condition: the patient must lie on his left side and the apex beat must be registered by means of a cardiograph with a button, lateral tube, and a screw to regulate the pressure of the button. Such a method answers the objections of Roy and Adami.[3] Care must always be taken to apply the button as accurately as possible, because, in some patients, the anatomical disposition (ribs, breast, emphysema of lungs, obesity) of the chest wall makes it difficult to obtain good contact between the impulse of the apex beat and the button of the cardiograph.

If so skilful a cardiologist as Sir James Mackenzie did not succeed in getting from apical tracings such good results as those we generally obtain, the explanation is to be found in the method employed—namely, the use of a funnel with the patients lying on their backs. This technique is wrong; the results were therefore irregular and the conclusions consequently unfavourable. It may seem very bold to differ in opinion from so great an authority as Mackenzie, whose work on the cardiac arrhythmias has so great a reputation in France as well as in England; nevertheless, I will endeavour to summarise the ideas underlying Pachon's technique and their importance in clinical work.

Pachon's Technique.

In the normal individual the apical tracings show, at the end of diastolic rest, a small elevation (*a*) which indicates the blood flow thrown into the ventricle by contraction of the auricle. Following this, a tall climb followed by a "plateau" designates the

ventricular systole and shows the following details (Figs. 1 and 2). The first part (1) of the ascending line rises slowly; this is Chauveau's and Pachon's "intersystole"[4]—i.e., the preliminary contraction limited to the papillary muscle of the auriculo-ventricular valves. The massive contraction of the ventricular wall begins with the nearly vertical climb (*s.v.*) at the moment of the closure of the auriculo-ventricular valves, coinciding with the first heart sound, and continues until a half-moon shaped notch (*o.s.*), Chauveau's or Laubry and Pezzi's[5] *encoche semi-lunaire*, which indicates the opening of the sigmoid valves, is reached. From *v.s.* to *o.s.* the presphygmic period (*Anspannungzeit* in German, *temps de mise en tension* in French) is measured. At *o.s.* the expulsive period begins. The true beginning (*d.v.*) of the descending line marks exactly the initial point of the ventricular diastole. A notch early in the descending line marks the closing of the sigmoid valves. After the line has fallen below the abscissa corresponding to the initial point of the cardiac cycle, there is a diastolic jump (*r.d.*), Marey's *ressaut diastolique* at the moment of the opening of the auriculo-ventricular valves, and finally the line remains nearly horizontal (diastolic rest) until a new auricular wave appears and the following cardiac cycle commences.

From every point of view, in order to mark the a.c.v. undulations on jugular tracings, the cardiogram has a great superiority over the sphygmogram (Lian; Pezzi and Sabri).[6] By means of an ordinary stilette, tracings modified by a parabolic deflexion are obtained; but, registered by means of a double-jointed stilette with rectilinear movement (Mougeot)[7] or by optical projection, the true shape and character of the heart beat can be exactly figured.

FIG. 1.

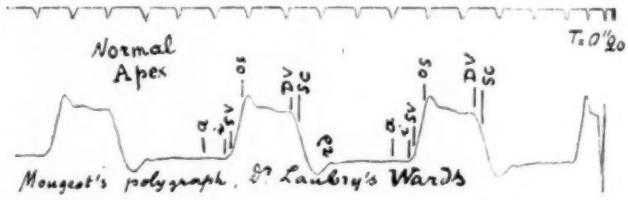

FIG. 2.

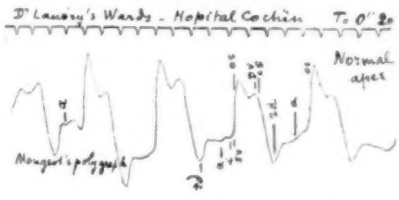

FIG. 3.

Optical registration of apex beat, combined with electrocardiogram in a case of left ventricle failure. Auricular fibrillation: *o.s.* notch extremely accentuated. Raising pressure period very long (0·36").

Chronological Law of the Heart.

The morbid changes in the cardiogram have been studied by numerous investigators. We cannot do more than quote a few of these changes. The relative amplitude of the auricular and ventricular waves may be abnormal. In healthy subjects (*a*) is about 30 to 40 times smaller than the ventricular rise; but in gallop rhythm (*a*) is relatively much taller (Laubry and Mougeot[8]). In cases of high blood pressure, and in aortic patients, the *o.s.* notch becomes accentuated and much deeper; there is a round, vaulted shape of the systolic ventricular plateau when the overloaded ventricular muscle has difficulty in expelling its contents (Moulinié, Turlais[9] [10]). In cases of aortic regurgitation, the diastolic rest-line does not remain horizontal from *r.d.* to (*a*), but rises slowly, because the intra-ventricular pressure is increasing more rapidly before the auricular systole.

Further, numerous chronometric measurements can be obtained from apical tracings, on which we can determine easily and exactly the beginning and end of systole and diastole and divide up the presphygmic and the emptying periods of systole; thus we are enabled to reckon the duration of each part of the cardiac cycle. Normally, the ventricular diastole lasts five-eighths, or 63 per cent. to 67 per cent., of the total duration of the cardiac cycle. Such is the "chronological law" of the heart (Huchard, Gillet), which is greatly altered in morbid conditions. In most cases of tachycardia and heart muscle failure, diastole is shortened to 50 per cent. or even more of the cardiac cycle, so that both silences are of equal duration and "embryocardia" or fœtal rhythm occurs. The relative lengths of both parts in ventricular systole may be abnormal. But this point requires to be studied more in detail. If we consider the kind of work to which the different parts of ventricular systole correspond, it is possible in a cardiogram to attempt an evaluation of the functional capacity of the left ventricle and to estimate this capacity in cases of heart failure.

The Energometric Index.

The emptying period did not seem to me to be a good base for an energometric reckoning. According to Starling,[11] the formula which ought to be employed is: $W = Q\,R\frac{wV^2}{rg}$. The factor $\frac{wV^2}{rg}$ is negligible and the chief factors are Q (volume in c.cm. of blood expelled at each contraction) and R (the peripheral resistance). Unfortunately, in man we cannot measure accurately either the volume of expelled blood, or its velocity (V) when passing through the aortic orifice, or the exact sum of the peripheral resistances.

On the other hand, during the presphygmic period the cardiac work is purely static and consists in raising the intra-ventricular pressure from zero to a little more than the arterial diastolic pressure. With Laubry I have therefore adopted the formula, $\frac{\text{diastolic blood pressure} \times 13}{T^2}$ = energometric index, in which T is in hundredths of a second the duration of the ascending line on the cardiogram (0·10" to 0·11").[12] The minimal blood pressure (in cm. of mercury), taken at the arm, must be multiplied by 13, the specific gravity of mercury being about 13 times that of the blood. In normal subjects we find the energometric index to be very nearly 1. During our first experiments we found the index higher than 1 in hypertrophied hearts with good functional capacity and lower than 1 in patients with heart failure. Further researches will show us what importance can be attached to this energometric index or whether the formula must be modified.

To summarise, the apical tracing or mechanical registration of the heart beat taken by means of an adequate technique would seem to be a method of examination of great value, because it gives information concerning the cardiac contraction, the duration of each phase, the intra-ventricular pressure curve, and functional value of the heart muscle—points concerning which the electrocardiogram tells us nothing.

(*Continued at foot of next page.*)

BILHARZIASIS OF THE URETER.

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BILHARZIASIS of the bladder has been fully observed and described by many writers, some of whom have drawn attention to the secondary effects produced on the kidneys and ureters by infiltration of the bladder wall round the ureteric openings. It is, however, far less widely recognised that, apart from the effect of bilharziasis on the bladder, there exists an infection of the ureters far more dangerous and intractable in its ultimate effects. Owing to the difficulty of observing changes in the ureter this has been very generally ignored during the life of the patients; the chief authorities on the subject devote only a few lines to it, and that chiefly from the pathological standpoint.

For many years surgeons practising in Egypt have been puzzled by the occurrence of typical cases of renal colic, in which the most careful radiographs of the kidney, ureter, and bladder have failed to show the presence of a stone. Some few of these are caused by pure uric acid calculi; occasionally one may be due to a Dietl's crisis, but the majority, probably nine out of ten, are due to bilharziasis of the ureter. In the same way most cases of hydronephrosis where no stone is found are really manifestations of the later stages of this disease and not secondary to disease of the bladder wall, to which they are so often attributed. This has been verified repeatedly on the operating table and post mortem.

I first described this condition in detail in the *Egyptian Medical Journal* in April, 1917. At that time I had met with over one hundred cases, all of which I had thoroughly examined and systematically investigated, and most of them I had followed in the different stages of the disease. When I wrote my article my object was merely to draw the attention of surgeons in Egypt to a very fatal and common form of bilharziasis which has received scanty notice in the literature. There was at that time little hope of influencing the progress of the disease. Now that bilharziasis can be successfully treated with tartar emetic, the outlook is far more hopeful, provided that cases can be recognised early. The latter point is an additional reason for drawing attention to this condition. The disease passes through three fairly definite pathological stages, each of which corresponds to a different clinical picture. It must be clearly realised that when the disease is bilateral, as it often is, two different stages may exist on different sides.

Morbid Anatomy (Figs. 1–3).

Bilharziasis of the ureter may exist apart from or in conjunction with vesical bilharziasis. It rarely affects the upper part of the ureter, the lowest 5 cm. being the site of election. Histologically the disease does not differ appreciably from bilharziasis of other organs.

Stage 1: *Infiltration with Bilharzia Ova.*—This manifests itself by the appearance of one or more of the following: (1) Sandy patches, (2) sessile infiltrations, (3) papillomata. At this stage the mucous membrane is still intact and the muscular wall in good condition. The kidney and pelvis usually appear quite normal. Occasionally a papilloma may act as a ball-valve, obstructing the flow of urine and producing in the corresponding kidney a hydronephrosis.

Stage 2: *Ulceration and Fibrosis.*—The ulceration is the result of necrosis of the mucous membrane covering the sandy patches and sessile infiltrations as well as of the falling-off of papillomata. The only mucosa left forms islets here and there, and the ulcers are covered with sloughs or incrustations of urinary salts. There is a round-celled infiltration gradually leading to fibrosis. Concomitantly with this, the muscular wall of the tube at the affected portion atrophies, being largely replaced by fibrous tissus. There is consequently a gradual narrowing of the lumen of the diseased part, and a secondary dilatation of the part above it. The pelvis of the kidney and its calyces are dilated too. The pyramidal area suffers from pressure atrophy, and eventually becomes narrower than the cortex, which does not seem to suffer until the next stage.

Stage 3: *Cicatrisation, Stricture, and Obliteration.*—The lumen of the affected part gets gradually obliterated until it is replaced by a mere solid fibrous cord. The upper part of the ureter gets more and more dilated and the kidney is eventually transformed into a fibrous sac with no remains of secreting tissue or mucosa. Such a sac contains urine or pus depending upon the absence or presence of infection. Infection, however, is a rare complication, unless the disease is accompanied by severe bilharziasis of the bladder.

Clinical Signs and Symptoms.

Stage 1.—The main symptom at this stage is renal colic, which I am inclined to attribute to the following causes: (1) Passage of blood clots produced at the lesion; (2) passage of sloughs, muco-pus, or urinary incrustations on the surface of the ulcers; and (3) passage of cast-off papillomata. The attacks last from a few hours to several days and disappear as suddenly as they start, the relief being usually accompanied by hæmaturia (with or without clots). These symptoms are repeated at variable intervals for some years, occurring at first on one side only, then they get less frequent on that side, appearing with the same intensity on the opposite side. During the attacks the kidney and ureter are tender, the latter particularly at the point of crossing the pelvic brim. Between the attacks the patient is usually in good condition, and on palpation no abnormality can be detected. The urine is usually highly acid, containing a variable amount of blood and bilharzia ova, otherwise its constituents are not altered. If the patient is cystoscoped at this stage, several papillomata may be seen on or adjacent to the ureteric opening. The opening itself will be seen contracting regularly, and the jets are strong and may be bloody. Less commonly, a large cauliflower-shaped papillomatous growth hides the opening from view. Passing the ureteric catheter is extremely difficult in all cases, since the papillomata form a sort of rampart over which the tip of the catheter slides, making accurate alignment almost impossible. The following cases illustrate this stage of the disease:—

CASE 1.—Male, aged 25, complained of symptoms of renal colic, first on left side, then on right. Attacks remained six or seven hours, sometimes as long as two or three days. Urine contained albumin, red blood corpuscles, and white blood corpuscles. Bilharzia ova. X ray examination negative; cystoscopy showed bilharzial papillomata around ureteric opening; bladder otherwise normal. Symptoms improved slightly on the administration of alkalies. Condition the same six months and one and a half years afterwards. Patient then lost sight of.

CASE 2.—Male, aged 19, complained of repeated attacks of renal colic on both sides. Urine contained albumin

MECHANICAL APEX TRACINGS.—REFERENCES.

(*Continued from previous page.*)

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blood, and pus. X ray examination, of kidneys only, negative. Cystoscopy showed bilharzial papillomata around left ureteric opening, though jet of urine was strong. Right ureteric opening tumefied, and jet poor. Ureteric catheter could be passed up ureter only for 2 cm., and could not be passed at all up the left ureter. X ray examination of the

FIG. 1.

Bilharziasis of ureter. Bladder (two-thirds natural size) showing two bilharzial papillomata surrounding the ureteric openings.

ureters later showed a stone in ureter near bladder. Two months later patient passed a stone similar in shape and size to the shadow in the X ray plate.

CASE 3.—Male, aged 27, complained of symptoms of renal colic on either side. Urine showed bilharzial ova. X ray examination negative. Cystoscopy showed bilharzial papillomata around both ureteric openings. A week later patient passed a small uric acid stone and subsequently two others.

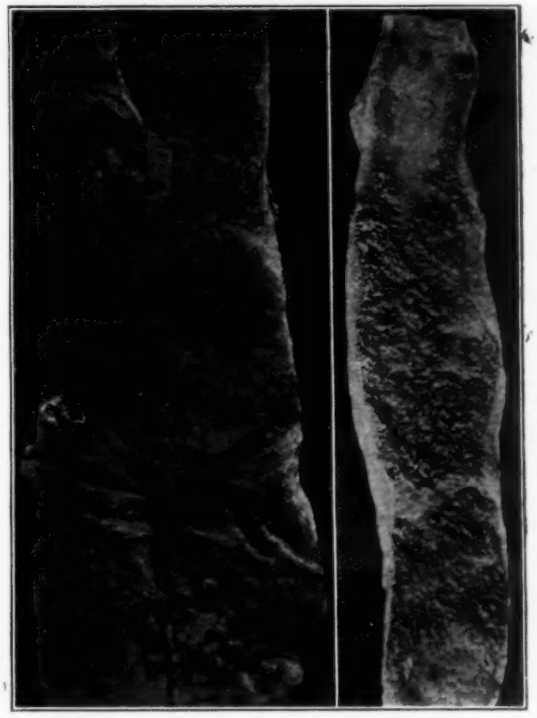
Stage 2.—The symptoms at this stage depend upon whether the urinary system is infected with bacteria or not. In non-infected cases the attacks of renal colic are replaced by a constant dragging pain in the loin which increases on any exertion. The patient becomes weak and anæmic, and complains of anorexia and headaches. On examination one or both kidneys are found enlarged and tender. If both are felt, one is usually larger than the other, the larger kidney being, as a rule, the one less affected. The total amount of urine is decreased, but every now and then the patient may pass large amounts. The specific gravity is low, 1007–1012. All constituents are diminished, urea decreasing to 8–12 g. in the 24 hours. Red and white cells are present, but tubular casts usually absent. Bilharzia ova may or may not be found. It is surprising how large numbers of cases can drag along in this state for two or three years considering their general and renal condition; one would not give them more than a few weeks to live. In infected cases the pain and tenderness are much more severe. There is an evening rise of temperature and pus is present in the urine. The patient looks much worse, loses weight very rapidly, and the final issue occurs earlier. Cystoscopy at this stage shows a patulous, immobile ureteric opening, out of which the urine flows in a continuous stream under very little pressure. Round the lips of the opening may be seen small ulcers with greyish, sloughy bases. The following cases illustrate this stage of the disease.

CASE 4.—Male, aged 60, complained of repeated attacks of renal colic during the last 12 years. Lately continuous dragging pains in both loins, general weakness, emaciation, and anorexia. Left kidney swollen and hydronephrotic. Urine: Sp. gr. 1007, urea 6 g. in 24 hours. X ray examination negative. Cystoscopy showed ulcerations and mucopurulent matter round the ureteric openings; mucous membrane of bladder in a state of chronic inflammation. Left kidney was tapped in the loin and 2 litres of fluid withdrawn. Patient was relieved after this, but returned a month later in the same condition; tapping was repeated, and 1¼ litres of fluid withdrawn, but his general condition was now bad. He returned again a month later, his condition being still worse. I lost sight of him after this.

CASE 5.—Male, aged 45, complained of attacks of renal colic on either side during the last 30 years. Terminal hæmaturia. No stones passed. Seen two years later; condition then as follows: Continuous dragging pains and fullness in left lumbar region; marked weakness and anæmia and evening rise of temperature; a large, tender swelling occupying left lumbar region. Urine: Sp. gr. 1013, contained pus, urea 12 g. in 24 hours. X ray examination negative. Cystoscopy showed the mucous membrane of bladder in a state of chronic inflammation, opening of right ureter could not be seen, opening of left ureter covered up with muco-purulent matter. Diagnosis: Left pyonephrosis. Condition of right ureter could not be determined. Pyonephrosis incised from back and drained; nearly 2 litres of pus were withdrawn. Condition improved, but subsequently became worse, and he died one year later.

Stage 3.—The patient now passes into a condition of chronic uræmia. He usually comes with a huge swelling in each loin. Sometimes one or both ureters can be felt dilated, a matter of no great difficulty, as the patient is by now very much emaciated. Suddenly complete suppression sets in, and the patient succumbs two to four days later in a condition of

FIG. 2. FIG. 3.



Two examples of bilharziasis of ureter. Fig. 2 shows dilatation, and, in the lower part, bilharzial papillomata (about five-sevenths natural size). Fig. 3 shows dilatation and ulceration of mucous membrane (about two-thirds natural size).

coma. He may have a few twitchings, but convulsions are always absent. On cystoscopy one of two appearances may be recognised. Either a patulous, non-contracting ureteric opening with no

urine flowing from it, or the opening may be so drawn up by contraction of the ureter that all that is seen in its place is a small funnel-shaped depression. The following cases illustrate this stage of the disease.

CASE 6.—Male, complained of retention of urine for four days. Two years earlier he had two attacks of retention of urine, at 15 days' interval, lasting 24 hours, accompanied by pain and swelling in the right loin, relieved by the passage of a stone and large quantities of urine. Examination: Indefinite swelling in right loin with dullness in front. On catheterisation no urine was drawn from the bladder. Right kidney was drained, and 200 c.cm. of urine drawn. Patient's condition steadily got worse, and he died on the twenty-fifth day after the operation. Post-mortem: Perinephric suppuration round the right kidney, which was in a condition of pyonephrosis. Two stones in right ureter, one about middle, the other at ureteric opening; left kidney in a condition of hydronephrosis. Lumen of left ureter almost obliterated at ureteric opening.

CASE 7.—Male, complained of retention of urine for four days. Examination: Both kidneys in a condition of hydronephrosis. Bladder empty. Both kidneys drained from loin. Patient died ten days later. Post-mortem: Both kidneys in a condition of marked hydronephrosis, with very little kidney substance left. Both ureters were dilated, except at a point just above ureteric opening, where lumen was almost completely obliterated.

CASE 8.—Male, complained of retention of urine and pain in right side for four days. Bladder empty. Diagnosis of calculus in right ureter made. Right kidney exposed from loin and found swollen. It was incised, and its pelvis was found slightly dilated, but did not contain any stone. A catheter could be passed down the ureter, but only as far as a point near the bladder. A drainage-tube was inserted in the pelvis of the kidney. Patient died three days later with signs of uræmia. Post-mortem: Right kidney in a state of slight hydronephrosis. Right ureter dilated, except for lower 3 cm., where it was represented by an impervious fibrous cord. Left kidney in a condition of advanced hydronephrosis, small in size, but with no kidney substance left. Left ureter in a similar condition as the right. Bladder showed signs of old-standing bilharziasis.

CASE 9.—Male, complained of retention of urine for seven days. Examination: Tender swelling in the abdomen with rigidity of the abdominal wall. Pulse was rapid and respiration thoracic. A diagnosis of acute peritonitis was made. Laparotomy was performed and the abdominal cavity was found to contain urine. Both kidneys were large and in a state of advanced hydronephrosis. A small rupture was discovered in the left kidney, from which urine flowed into the general peritoneal cavity. Left kidney was removed and right drained from the loin. Patient died on the second day of the operation. Post-mortem: Lumen of right ureter obliterated in its lower 3 cm. and dilated above this. Left kidney in a state of hydronephrosis. Left ureter in a similar condition as the right. Bladder showed signs of old-standing bilharziasis.

CASE 10.—Female, aged 21, complained of severe pain in the right loin and incontinence of urine. Gave a history of several attacks of renal colic in the right side. Attacks were followed by the passage of blood-stained urine mixed with pus. On examination right kidney was found tender, enlarged, and cystic. Left kidney could not be felt. Urine: Alkaline, sp. gr. 1015, contained blood, pus, albumin, and bilharzia ova. X ray examination negative. Cystoscopy was not practicable. Operation: Nephrectomy; kidney showed extreme hydronephrosis with a mild infection. Patient passed 400–800 c.cm. urine mixed with blood daily after the operation. She gradually got worse, and died on tenth day after operation with symptoms of uræmia. Post-mortem: Left kidney showed moderate degree of pyonephrosis; lumen of right ureter in lowest 2 cm. almost completely obliterated, upper part much dilated; left ureter in a similar condition; bladder showed no signs of bilharziasis. An empyema on left side of chest.

CASE 11.—Male, aged 40, transferred from the medical section with a diagnosis of calculus anuria. History of anuria for four days with severe pain in the right lumbar region. Operation: Right lumbar nephrostomy. Kidney was found hydronephrotic. No calculi found. Catheter passed down the ureter stopped near the bladder. Patient died of uræmia three days later. Post-mortem: Right kidney hydronephrotic, left small, being represented by a fibrous sac containing a small quantity of fluid. Right ureter, lowest 3 cm. impervious, rest dilated. Left ureter in a similar condition. Bladder showed signs of old bilharziasis.

Diagnosis.—The diagnosis of these cases in any stage depends upon: (1) Recognition of bilharzia ova in the urine; (2) absence in radiographs of the shadow of a stone in the kidney, ureter, and bladder; (3) cystoscopy. Of these, cystoscopy is by far the most important. For although the actual lesion is inside the ureter, one would be quite justified in concluding that the lesions seen at the ureteric opening are but a continuation of the same process higher up.

Differential Diagnosis.—This, in all stages, is mainly from calculus. It must, however, here be emphasised that the two conditions may coexist, and that an attack of renal colic in a patient with ureteral bilharziasis may be due to the passage of a renal calculus. Hence the importance of careful radiography.

Treatment.

Only in the first stage of the disease may tartar emetic be expected to effect a cure. Early diagnosis is therefore the only way of saving the patient's life, as the later stages are always fatal. The surgeon must, however, always keep in mind that while one kidney may be disorganised, the other may be still in a condition amenable to treatment by tartar emetic. During the attacks of renal colic treatment along the usual lines is all that is needed.

In the second stage nephrectomy for hydronephrosis and pyonephrosis is justified if the disease is unilateral, which is, however, very uncommon. Abdominal nephrectomy will be found much easier than the lumbar operation, which is sometimes rendered impracticable owing to the shape and size of the diseased kidney. It is of vital importance that the function of each kidney should be estimated separately before any such operation is undertaken since the hydronephrotic kidney may be the only one that is functioning, the other kidney having been destroyed at an earlier date. If the disease is bilateral tapping the kidney through the loin by a Potain's aspirator will often relieve the patient for two or three months, when the same process may be repeated if necessary.

In the third stage no treatment is of any avail. Nephrostomy does not seem to modify the progress of the condition in any way.

Summary.

1. Bilharziasis of the ureter exists, and may be the only, or the most prominent, manifestation of the disease. The disease is usually bilateral, though more advanced on one side than on the other. The disease is very chronic, and the stages merge one into the other.

2. The disease ends in the formation of fibrous tissue, which replaces the normal coats of the ureter. This leads to contraction and narrowing or even complete obliteration of the lumen of the lower part of the ureter. Secondary to this the upper part of the ureter and pelvis of the kidney become dilated.

3. Ascending infection is rare, and is mostly a complication of bilharziasis of the bladder.

4. The disease, if neglected, is very fatal, ending in death, usually from uræmia and rarely from septicæmia.

My thanks are due to Dr. Anis Onsy Bey, clinical pathologist to the hospital, who prepared all the specimens for me, and to Dr. M. Erfan and Mr. A. W. Mooro, registrars at the hospital, for their help in the preparation of this article.

A CASE OF ARTERIO-VENOUS ANEURYSM OF THE NECK.

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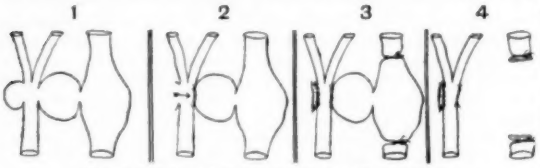
THE case here described illustrates several points of surgical and medical interest.

The patient, a labourer aged 39, was admitted under my care, nine months after a gunshot wound of the neck, with all the signs and symptoms of an arterio-venous aneurysm of the left common carotid artery near its bifurcation, as well as the type of sensory aphasia known as word-

forgetfulness. Operation was advised on account of the patient's distressing insomnia and the fact that the aneurysm was gradually getting bigger.

Operation.—Anæsthetic, chloroform and ether; duration, two and a half hours. The left side of the neck was opened up



Diagrams showing the steps of the operation.

by a Z-shaped incision over the sterno-mastoid muscle. The latter was cut near its origin and turned upwards. Crile clamps were applied to the common carotid and the internal jugular at the root of the neck, and to the internal and external carotids and the upper part of the internal jugular. One clamp sufficed for both the internal and external carotid arteries. Dissection then showed the condition to be a varicose aneurysm, the size of a walnut, of the common carotid artery and the internal jugular vein, together with a small saccular aneurysm, the size of a hazel-nut, on the opposite side of the artery, and extreme dilatation of the corresponding part of the vein (Fig. 1). The vagus nerve was adherent to the arterial aneurysm and on it was a traumatic neuroma about 8 × 4 mm. The cervical sympathetic was not implicated. The arterial aneurysm was first excised. Through the opening thus produced, the communication between the artery and the other sac could be clearly seen and was closed by a continuous "Matas" suture of No. 000 silk sterilised in liquid paraffin, penetrating the intima and muscularis only (Fig. 2). Then the wound resulting from excision of the arterial aneurysm was closed by Dorrance's method (Fig. 3). Lastly, the dilated portion of the jugular vein, together with the varicose aneurysm were totally excised between two ligatures (Fig. 4). The wound was kept wet with liquid paraffin all through the operation. On removing the Crile clamps, pulsation returned in the now slightly constricted artery, and there was slight oozing through the Dorrance suture, but none through the Matas suture. The oozing, however, stopped almost immediately on the application of a piece of muscular tissue. The sterno-mastoid was then sutured in position and the area of operation drained by a small tube inserted through a separate skin incision.

Progress of Case.—There was some superficial sepsis in the lower part of the wound which soon cleared up, the wound having completely healed on the eleventh day. The patient, however, developed double broncho-pneumonia on the day following the operation and died of it on the thirteenth day.

Autopsy.—The lungs were both the seat of advanced broncho-pneumonia going on to abscess formation and commencing gangrene. The brain showed an area of old softening the size of a half-crown in the posterior part of the left temporal lobe—evidently the result of an embolus produced by the gunshot wound of the artery. The lumen of the artery was patent and smooth. There was no trace of ante-mortem clot. The aneurysmal opening, which was closed by a continuous suture from the inside, was hardly apparent to the naked eye. The wound, which was closed by mattress suture from the outside, showed the line of suture apparently covered by endothelium (Fig. 5).

Paraffin sections of the artery at the site of the operation (Figs. 6 and 7) showed that: 1. Both openings had healed completely, and the lines of suture were completely covered over with endothelium several layers thick. 2. Although cosmetically the intra-arterial suture was superior to the Dorrance suture, healing had taken place by means of much more fibrous tissue in the former than in the latter.

This case, therefore, supplied the following interesting information: 1. Gunshot wound of the common carotid artery as a cause of cerebral embolism, resulting in word-forgetfulness. 2. The microscopic appearance of a healed arterial wound 13 days after its infliction and suture. The case further illustrates the relation between "word-forgetfulness" and a lesion of the posterior part of the left temporal lobe of the brain; and the fact that a lesion of one vagus nerve is compatible with a normally functioning heart.

FIG. 5.

FIG. 6.

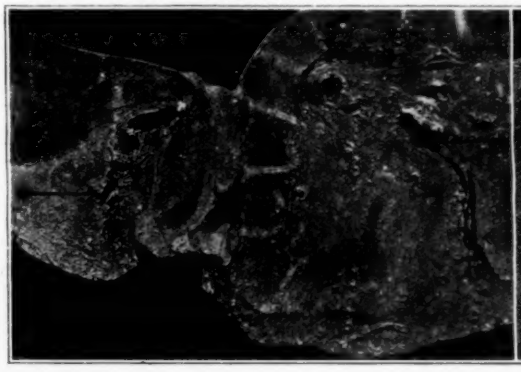


FIG. 7.

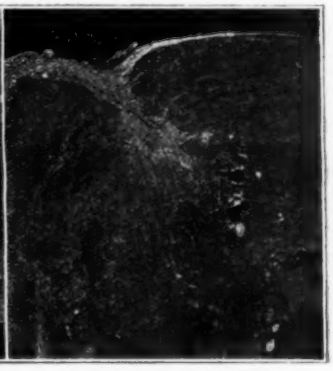


FIG. 5.—Common, external, and internal carotid arteries, slit open (two-thirds natural size). 1, Common carotid; 2, external carotid; 3, internal carotid; (*a*) scar after intra-arterial non-penetrating suture; (*b*) scar after Dorrance's penetrating mattress suture.

FIG. 6 is a microphotograph of a transverse section at the site of the Dorrance suture, showing eversion of all the layers of the arterial wall as well as the tract of the silk suture. The endothelium appears as a faint light border to the darker muscularis. The arrows indicate the tract of the silk thread. FIG. 7 is a microphotograph of a section at the site of the intra-arterial suture.

I am indebted to Drs. A. Girgis and M. Ragheb for the paraffin sections and the photographs.

CHRONIC PROSTATITIS AND LUPUS ERYTHEMATOSUS.

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LUPUS erythematosus is a chronic inflammatory disease of the cutis, possessing special characteristics, and due to a toxin circulating in the blood. It is, in its essence, a toxic erythema of a non-specific character. The French view, that it is caused by the toxic products of the bacillus of tuberculosis, is true only in a certain small proportion of cases. In most instances it is not possible, by any clinical or other means, to demonstrate the presence of a tuberculous focus in any part of the body. Indeed, considering the high incidence of tuberculosis in the community, one would expect—were the French view correct—to find lupus erythematosus much more frequently than one does. The source of the toxin is undoubtedly in some cases a tuberculous deposit in the lungs;

but it is much more often to be found in a non-tuberculous condition elsewhere.

A pyorrhœa alveolaris, a chronic tonsillitis or rhinitis, a chronic intestinal infection, may each be the underlying cause of the disease. Such conditions are comparatively common, and, if one includes tuberculosis, it is not unwarrantable to assume that the greater proportion of the population can be labelled with one of them. It would therefore appear—when one considers the comparative rarity of lupus erythematosus—that there must be some other causes which determine the outbreak of the disease in certain people.

In many instances it has been shown that a nervous factor is present. Perrin and others record cases in which the disease has appeared after an emotional storm. The typical limitation of the patches of erythema, and the areas generally affected, make an angio-neurotic element appear to be a reasonable supposition. The face—a region in which vasomotor reactions are common under nervous and climatic stimuli—is a favourite site of lupus erythematosus. Its frequent situation in the chilblain areas, and the many close relationships between it and Raynaud's disease, point most decidedly to a vasomotor factor. Trauma can be shown, in certain instances, to have decided the point of outbreak. The position would, then, appear to be that a toxin circulating in the blood may cause no cutaneous symptoms until some other influence comes into play, which, by causing a vasomotor upset in some particular area, gives rise to the condition of lupus erythematosus in that area.

It is clear, then, that the main principle of treatment is to eradicate the toxin and its place of manufacture. Any light that can be thrown upon such foci, and upon the causal organisms, should be of some value. So far as my inquiries go, I have not been able to trace any reference to a relationship existing between lupus erythematosus and chronic gonorrhœa. For that reason the publication of the following case may be of interest:—

An officer in the Mercantile Marine, aged 43, consulted me on Jan. 10th, 1923, complaining of increasing difficulty of micturition and occasional "morning drop." He was infected with gonorrhœa in Bombay in 1910. He treated himself with permanganate injected with a hand syringe, and also took capsules of sandalwood oil. He had "inflammation of the bladder" a few weeks after he commenced this treatment. He consulted a chemist for this, who gave him medicine. He considered himself cured after about two months, although he noticed a glueing together of the lips of the meatus in the mornings. When he came to see me his ship was laid up for refitting, so that he was able to have continuous treatment. He is by no means a total abstainer from alcohol, has had malaria, and was torpedoed in 1916. Several patches of lupus erythematosus were present on the nose, cheeks, and chin, but especially on the nose. This, he stated, had been present for about seven years.

Condition on Examination.—Two urethral strictures, 2 in. and 3¼ in. from the meatus. Heavy threads in the last urine. Prostate slightly enlarged, harder than normal, and somewhat nodular. Pus cells and numerous organisms present, but no gonococci found in the prostatic secretion.

Diagnosis.—Stricture. Chronic gonococcal prostatitis.

Treatment.—It was justifiable to assume from the condition and from the history that the prostatitis was gonococcal in origin. Weekly injections of a residual stock vaccine—gonococci plus secondary organisms—prepared by Dr. C. E. Jenkins, pathologist, Salford Royal Hospital, were given for ten weeks. Prostatic massage was performed twice weekly. Weekly dilatation of the strictures was instituted by means of flexible bougies and by the Kollmann's irrigating dilator. Posterior irrigation—Janet method—daily, and atropine suppositories twice weekly. Once daily 2 c.cm. of iodargol were instilled into the bladder and posterior urethra, and a collodion seal applied to the urinary meatus. This seal was kept on for three hours. As it occurred to me that there was a possibility that the lupus erythematosus was a consequence of his prostatic condition, I refrained from treating his facial disease locally.

Course of Case.—During the first four weeks the facial condition became worse, being obviously stimulated into activity by the massage and the instrumentation. From then onwards, the hyperæmia rapidly decreased. By the tenth week it had practically disappeared except one small patch, rather less than a threepenny-piece in size, on the bridge of the nose. This was treated with carbon dioxide snow on the occasion of his last visit. At that time the prostate was normal, the strictures had been dilated to No. 27 French, and urethroscopic examination showed as the only abnormality a slight increase of hyperæmia and prominence of the verumontanum. He was under my treatment till March 23rd, when he returned to sea.

I regard this case as one in which the focus of infection causative of the lupus erythematosus was in the prostate. The patient could not be certain that the skin condition was not present before he was torpedoed, he thought that it was, but he was sure that it became worse afterwards. The nervous excitement of that occurrence, the exposure to sun and wind in a rowing boat for two days under severe mental stress, were, in all probability, the deciding factors for the facial outbreak or its aggravation. He has been engaged principally in the Far East trade, and in consequence has been much exposed to the sun.

I have felt that this case indicates that in every male patient who is suffering from lupus erythematosus, the venereal history should be inquired into; and, whether it be positive or negative, the genito-urinary tract should be thoroughly examined to eliminate the possibility of the focus of infection being situated therein.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

A MEETING of this Society was held on Nov. 26th with Dr. HERBERT SPENCER in the chair.

Mr. W. SAMPSON HANDLEY opened a discussion on

THE TREATMENT OF ACUTE SUPPURATIVE GENERAL PERITONITIS.

The subject of debate should, he thought, be restricted to cases of acute unlocalised or unlimited spreading or plastic suppurating peritonitis, threatening to end in death within a few days at most, and due to pyogenic organisms. He proposed to present only the results of his own experience, mainly of peritonitis following appendicitis. The clinical concept of "general peritonitis" was well established, and must not be taken to imply the belief that the peritonitis was universal. This was rarely the case, even post-mortem. The class of case they were dealing with developed, within a short period of onset, the clinical picture of general peritonitis as described in text-books, with a universally distended, rigid, tender abdomen, and repeated vomiting, which became offensive and assumed the type of frequent effortless regurgitation. The passage of flatus and fæces ceased, the pulse became rapid, at first wiry, then running and uncountable. The face became anxious and drawn, and a deadly coldness of hands, feet, and nose finally indicated that death was a matter of hours—a fact of which, under the stimulant influence of the streptococcal poison, the patient was often acutely conscious.

Consideration of Accepted Treatment.

In the accepted treatment of peritonitis developed by Murphy, Fowler, Barnard, and others, immense strides had been made in the last 20 years with regard to prevention, though much remained to be done. It was now universally recognised that in dealing with an acutely inflamed appendix medical treatment was useless, the only rational course being to remove the offending organ within two hours of diagnosis. As even the latest text-books made no distinction between some of the early and late symptoms of appendicitis, avoidable delay in diagnosis still often occurred. The sudden onset, in a patient previously healthy, of acute abdominal pain, soon settling in the right iliac fossa, if accompanied by an initial vomit and by local deep tenderness at the appendix point only, justified the diagnosis of acute appendicitis, in the absence of all

other signs and symptoms. It should be emphasised that muscular rigidity and pyrexia were often absent in the early stages. Again, if the case was not a very early one, and especially if there was rigidity in the midline of the abdomen before the appendix was approached, a small median incision should first be made and a gauze swab cautiously introduced to the bottom of the recto-vesical pouch. If pus or dirty fluid was present, a drainage-tube must be left in the pelvis. The appendix was then removed through the same or a separate incision; if no pelvic infection was found, the median incision was closed, and the appendix removed by the usual right iliac incision. The adoption of this rule would often disclose unsuspected early infection of the pelvis, the first stage of a pelvic abscess, or a general peritonitis.

Removal of Septic Focus, Drainage, &c.

An operation for peritonitis was incomplete unless opportunity was taken to remove the septic focus or close the perforation, though in very rare cases the procedure might be impossible or inadvisable. In established peritonitis or intraperitoneal abscess, it was courting unnecessary risk to close the abdomen without providing drainage. Only in massive fouling of the peritoneum by the contents of the stomach or intestine should irrigation be resorted to, and then only with saline at 103° F., mixed to a uniform temperature. Very hot fluid might cause fatal shock. Mr. H. W. Carson in his historical survey of the treatment of peritonitis had rightly emphasised Murphy's method of continuous saline infusion in the milder cases of unlocalised peritoneal infection, a method which had doubtless saved many lives. Lawson Tait's treatment of peritonitis by saline purgatives represented at its time a great advance; it probably succeeded only in milder types of infection, and where exposure, chill, and rough handling of the intestine had inhibited its action for a time. Purgatives, however, were frequently ineffectual either because they were vomited, or because the bowel was too paretic to react to them; they might cause spread of the peritonitis, but were indispensable in the milder forms, although ineffectual in the graver ones. Similarly, eserine or pituitrin might score a triumph in mild cases.

Antitoxins and Vaccines.—"Ileus Duplex."

Experience gave him some belief in the virtue of antistreptococcic serum, if only for its food value where all food was rejected. He thought all vaccines irrational in the treatment of such an acute intense toxæmia as accompanies peritonitis. These standard practices in the treatment of peritonitis, though successful in milder cases, were inadequate in graver peritoneal infections. In these graver cases many surgeons counselled non-interference and despair. He wished to combat this attitude, and to show that many cases of general peritonitis, hastening to a fatal issue in spite of energetic treatment on accepted lines, could be saved by recognition of the fact that the patient was dying of intestinal obstruction. Acute appendicitis passed into general peritonitis by rupture of the appendix from 24 to 48 hours after onset, and by a trickle of pus or foul fluid over the brim of the pelvis to the bottom of the recto-vesical pouch; with a sufficiently virulent infection, the conditions for a general peritonitis were then established. Peritoneal inflammation began at the bottom of the recto-vesical pouch and spread upwards through the abdomen; this fact was the key to successful treatment.

Three stages were recognised: (1) Pelvic peritonitis, (2) hypogastric peritonitis, and (3) terminal or "clinical picture" stage. Even in the last stage the peritonitis was rarely universal. The continued vomiting showed that the stomach and upper intestine retained some contractile power, and were therefore not intensely inflamed. Post-mortem observations confirmed this conclusion. Even in the earliest or pelvic stage of a general peritonitis, intestinal obstruction might supervene, accelerating the upward spread of the disease. With these cases he had dealt in his Hunterian lecture in 1915. There were two points of obstruction in the intestine, the inflamed pelvic ileum and the inflamed pelvic colon; he had named the condition "ileus duplex." It was not sufficient to short-circuit the distended supra-pelvic ileum into the cæcum, for the obstruction in the pelvic colon remained and the patient died. Four such cases out of a total of five ended fatally. If, in addition, a cæcostomy opening was made, recovery was the rule; so far, since adopting this treatment, he had not lost a case. In 1915 he had not recognised, what he now clearly saw, that ileus duplex represented the early stages of a general peritonitis. Prompt treatment demanded early recognition of the clinical signs of ileus duplex. Ignoring local signs in the right iliac fossa due to the previous peritonitis, the usual course of events was as follows: After operation for acute appendicitis, for a day or two all went well, but temperature and pulse failed to return to normal, and on the second or third day vomiting returned, persisted, and might finally become offensive. The passage of flatus and fæces ceased, and there was some distension of the hypogastric region; but there was no muscular rigidity, for at this stage peritonitis was confined to the pelvis. If drainage, saline infusion, purgatives, and enemas failed, prompt operation was necessary. Priority in the recognition and successful treatment of cases of similar character following operations on septic pelvic conditions, such as carcinoma of the cervix, belonged to Mr. Victor Bonney, who advocated treatment by jejunostomy, with subsequent resection of the jejunum a fortnight later when the obstruction had passed off; in his hands this plan had been very successful. His own method of treatment by ileo-cæcostomy and cæcostomy (continued Mr. Handley) had the advantage that it did not subject the patient to the discomfort and loss of nutriment involved in enterostomy, and also usually avoided the necessity of a second operation, for the cæcostomy generally closed spontaneously. But if the patient's condition was very grave, jejunostomy, as a quicker operation, might be preferable.

Hypogastric Peritonitis.

If the treatment described was carried out, the upward spread of peritonitis was almost invariably arrested, but if the obstruction remained unrelieved, the condition began to approximate to the typical general peritonitis described in the text-books. The peritonitis spread upwards to the hypogastric region, the hypogastric muscles became rigid, and the lower part of the abdomen became distended and immobile. The distension had a well-defined upper limit just above the umbilicus; higher still the muscles were not rigid, and still moved slightly with respiration. The vomiting was still gastric, or might have become offensive. The pulse was 120 or 130, and the condition evidently grave, but the extremities were still warm.

Clinical Picture Stage.

If nothing was done, the patient passed, probably within 24 hours, into the "clinical picture" stage, with cold extremities and running pulse. Ileo-cæcostomy and cæcostomy would now be useless, the supra-pelvic ileum being paralysed by the ascending tide of peritonitis, but the condition was still not hopeless, for the abdomen *above the umbilicus* was still free from inflammation. He had tried to improvise a complete emergency alimentary canal above the level of the flood by reopening the abdomen laterally to the umbilicus, and anastomosing the uninflamed transverse colon to a distended but uninflamed coil of jejunum. A temporary exit from the large intestine was then made by tying a tube into the cæcum. The success of this plan had exceeded his hopes, recovery following in three out of four cases.

Discussion.

Sir CUTHBERT WALLACE recalled correspondence on the subject under discussion which had passed between Mr. Handley and himself during the war. The speaker had advocated the methods of treatment described, but without good result; nevertheless, he still might

be persuaded of its usefulness. Mr. Handley's treatment was really the treatment of intestinal obstruction; he was going to talk about peritonitis. There were two routes by which patients were killed—the diaphragmatic route and the route of the vessels. The diaphragmatic route was the more dramatic, and had impressed itself upon clinicians. He had seen the surgical treatment of peritonitis from its outset; he himself had once used evisceration and lavage, which had then seemed better than any other method. At present he simply removed or closed the infecting focus and shut up the abdomen; since 1906 he had never drained the latter, and had had no reason to go back on this practice. He laid emphasis on the fact that the peritoneum would kill bacteria, whilst the abdominal wall would fall a victim to them. He considered the surgeon's work to be done when the infective focus was removed.

Mr. GARNETT WRIGHT found that the discussion, like all discussions on peritonitis, was limiting itself to appendicitis. General peritonitis, extending from the floor of the pelvis to the diaphragm, was uniformly fatal and seldom met with. Despite modern treatment based on the work of Murphy, the mortality remained high; there was not much further advance till Mr. Handley's paper in 1915, which marked progress not by its description of the pathology of ileus duplex, but by the statement that patients were dying not from toxæmia but from intestinal obstruction. Personally, he believed such obstruction to be due to matting of the bowel. Several times he had separated coils of intestine and had found even when acute sepsis was present that patients recovered; he found the bowel flattened, but evidently not paralysed. They were all familiar with the type of patient who presented symptoms of obstruction outweighing the inflammatory symptoms. The rectus or mid-line incision was preferable to McBurney's incision, and the latter should be abandoned. Mr. Handley had described the operative measures he preferred; he (Mr. Garnett Wright) held that if temporary relief were given the bowel would recover its power. Enterostomy was most valuable when performed early, as soon as the symptoms of obstruction appeared. The aim should be to keep the bowel empty; aperients precipitated the onset of obstruction.

Mr. H. W. CARSON felt certain that peritonitis was preventable, and due only to delay in acting upon the diagnosis which ought to be made from the clinical picture. He believed with Mr. Handley that the inflammation spread from one point through the peritoneal cavity; the mortality was directly in proportion to the delay in operating. The treatment of peritonitis occurred before the patient came to the operating table; it occurred at home. The sitting-up position was useful before operation. Nothing should be given by mouth to the patient; if the bowel was loaded an enema, or if empty a saline, should be given, whilst the patient was waiting for the ambulance. He always ordered an enormous fomentation to be applied, going right round the patient's back and reaching down to the pubes. If the lesion was not found the patient would die. He believed in drainage. He made it a rule to operate if there was intestinal pain, whether obstruction was present or not.

Mr. R. P. ROWLANDS believed that, in the main, cases of peritonitis did die of intestinal obstruction. About 2500 people died of acute appendicitis every year in England and Wales, mostly through peritonitis. The latter condition was avoidable, but usually the patient did not consult a doctor soon enough, and the doctor did not diagnose the condition in time. The first essential was to remove the focus of infection or to stop the leak. Then the mass of extravasated material must be moved from the abdomen. Speed was almost equally valuable with good work. He did not wash out the peritoneal cavity, but packed it with dry gauze rolls, which could be pulled out entire, leaving the peritoneum dry. He believed in drainage in bad late cases; gauze drainage was to be avoided. Anastomosis between, say, the jejunum and colon did not meet the requirements of the condition, as the lower bowel was badly infected.

Dr. V. Z. COPE thought that sufficient distinction had not been made between the different types of peritonitis. He had recently had a case of general suppurative peritonitis starting in the upper abdomen, with no great distension, yet with the same symptoms as those already described. In peritonitis the poison was partly in and partly out of the bowel; the latter was more or less paresed, but not always paralysed. Unless the various ptomaine poisons within the bowel were got rid of, partial obstruction occurred. Mild aperients might be given at first, and stronger aperients after 36 hours; then enemata should be tried, and then cæcostomy or jejunostomy. The contents of the peritoneum outside the bowel should also be dealt with. Vaccines and serums were useful. In severely toxic cases some form of immuno-transfusion might be tried with advantage.

Dr. H. H. RAYNER stated that many patients died of acute toxæmia from absorption through the intestinal membranes long before obstruction had time to occur. Death from obstruction took place when nature had limited the field of infection at the onset.

Mr. T. H. C. BENIANS spoke of peritoneal immunity and the pathogenicity of *B. coli*; acute toxæmic conditions, he believed, were due to coliform organisms rather than to streptococci.

Mr. WARREN LOW thought that the term "general peritonitis" covered an enormous number of diseases; of these, the peritonitis arising from acute appendicitis was the commonest and the most amenable to treatment. He agreed as to the importance of removal of the septic focus, but in a collapsed patient he had left a suppurating appendix in the body and the patient had lived. In cases of distension he had emptied several coils of bowel through an incision and found the procedure useful.

Dr. SPENCER believed that the less drainage was employed the better, but that, nevertheless, patients would be killed if the method were never used.

Mr. SAMPSON HANDLEY briefly replied.

ROYAL SOCIETY OF MEDICINE.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

Exhibition of Cases and Specimens.

A MEETING of this section was held on Nov. 23rd, Mr. R. H. ANGLIN WHITELOCKE, the President, being in the chair.

Dr. J. D. ROLLESTON showed a specimen of

Hair-Ball of the Stomach.

The specimen was from a girl aged 15—an epileptic idiot who suffered from vomiting and diarrhœa a week before her death. A mass was found in the epigastrium which was thought to be the enlarged right lobe of the liver. At post-mortem the stomach was found to be filled with a collection of hair which formed a complete cast of that organ. On inquiry from the mother it was learned that the patient had been in the habit of eating her hair since she was a baby. Dr. Rolleston reviewed the bibliography of this subject. He considered the X ray appearance so distinctive—the hair-ball appearing a lighter area in the midst of the dark shadow of the bismuth—that a correct diagnosis should now be the rule instead of the exception.

Mr. H. A. T. FAIRBANK showed a photograph of a hair-ball removed from the ileum of a girl, aged 8 years, whose symptoms resembled those of partial obstruction.

Dr. W. E. ROBINSON showed a case of

Lymphangioma of the Foot

in a child aged 7 months. The foot was noticed to be growing larger, especially in the region of the metatarsal bones and terminal phalanges. The X ray, however, showed the bones to be perfectly normal. He asked for suggestions as to treatment.—Mr. C. MAX

PAGE suggested that a Syme's amputation appeared to be the most rational surgical treatment for this case.—Mr. FAIRBANK suggested that the diagnosis should be that of hypertrophy of the foot, and agreed with Mr. Max Page as to treatment.

Dr. A. BENJAMIN showed a case of

Precocious Puberty

for Dr. R. Hutchison. The child, now aged 3½ years, commenced menstruation at the age of 17 months, and had continued menstruating at more or less regular intervals of one month up to the present date. The breasts were well formed, and hair was present on the pubic region. Her weight and height were that of a child of 8 years. Mentally she was normal for a child of her age, but had fits of bad temper. The carpal bones were ossified. He placed this case, by a process of exclusion, amongst those due to ovarian hypersecretion, although under an anæsthetic no definite evidence of this could be obtained.—Dr. PARKES WEBER agreed with this diagnosis.

Dr. C. C. WORSTER-DROUGHT showed a case of

Progressive Neural Muscular Atrophy

(peroneal or Charcot—Marie-Tooth type), in which the upper limbs were also affected. The patient, aged 13, was one of a family of three, the other two not being affected. After the age of 2½ it was noticed that she turned her toes in and tended to fall down when she walked. During the past four years her feet had become more deformed and the hands and arms had wasted considerably. Her present condition was thin and nervous, and she constantly wriggled her feet and legs. There was a tendency to bilateral main-en-griffe with marked wasting of the small muscles of the hand. The lower extremities showed pronounced talipes equino-varus of both feet with wasting of the peronei. The electrical reactions were given in detail. Dr. Worster-Drought stated that it was difficult to draw a hard-and-fast line between certain neural atrophies, nuclear atrophies, and muscular dystrophies.—Dr. E. W. NEILL HOBHOUSE gave the details of a similar but less marked case. The remarkable feature of his case was that one femur was smaller than the other. He asked if such an abnormality had been previously noted.

Dr. NORAH SCHUSTER and Dr. DONALD PATERSON showed a specimen from a case of

Paroxysmal Tachycardia,

in an infant aged 9 weeks. The specimen was the heart from a female child, who had been admitted to the Infants Hospital, Vincent-square, for blueness and shortness of breath since birth. The infant weighed 8 lb. When first seen it was wasted, feeble, and cyanosed, with a pulse of 200 per minute. The heart seemed enlarged, so also the liver. During the two days in hospital before death there were four definite paroxysmal attacks, lasting about ten minutes each, during which the infant had marked dyspnœa and cyanosis, and was in obvious distress. The pulse at these periods became uncountable, afterwards falling as low as 140. Digitalis had no effect. At post-mortem a patent inter-ventricular septum, patent foramen ovale, and patent ductus arteriosus were found. The pulmonary artery arose from the left ventricle and the aorta from the right ventricle. Microscopically the heart muscle showed degeneration with intercellular fibrosis.—Dr. GEORGE SUTHERLAND considered this a very rare case, and cited a similar case of paroxysms of tachycardia, which had been mistaken for "petit mal."—Dr. WEBER suggested that the cases reported in French literature under the heading of paroxysmal cyanosis were similar to this case.—Dr. PATERSON agreed that the reported cases were very few, but considered that attacks of blueness with rapid breathing were not uncommon in children with congenital heart disease. He wondered how many of these might be cases similar to the one reported should they be as closely observed as this one had been. It was only by having the pulse charted hourly, and specially taken during attacks, that the condition could be diagnosed.

LIVERPOOL MEDICAL INSTITUTION.

A MEETING was held on Nov. 15th, with Dr. J. HILL ABRAM, the President, in the chair.

Dr. HENRY COHEN read a note on the

Value of Hypertonic and Hypotonic Saline Solutions in Cerebral Conditions.

After a brief résumé of the experimental evidence on which this therapeutic method is based, he recorded ten cases, six of cerebral tumour and four of post-operative cerebral hernia, in which marked alleviation of symptoms followed intravenous injection of 20 c.cm. of 30 per cent. sodium chloride solution. He commented on the oral administration of salt in these conditions, and on the use of hypertonic salines in the meningismus of acute infections, prior to cerebral operations, in the diagnosis of extracranial from intracranial causes of headache, and in the prevention of foraminal crowding following lumbar puncture in cases of cerebral tumour. The value of hypotonic salines in post-puncture headache was also recorded.—In replying to the discussion, Dr. Cohen pointed out that a considerable amount of experimental work was yet to be done, and suggested that ophthalmic surgeons should try these hypertonic salines in cases of increasing intra-ocular tension.

Mr. W. A. THOMPSON read a note on

Renal Sarcoma of the Kidney in an Infant.

The patient was a female child, aged 15 months, who was anæmic, emaciated, and had a large semi-solid swelling in the left lower abdomen. This swelling had been noticed for six months. It was moderately smooth in outline, there was no notch, there were dullness and bulging in the loin with colon resonance in front. The urine was normal, and had apparently always been so. A renal sarcoma was diagnosed and operation advised. The operation was carried out through an incision to the outer side of the left rectus. The peritoneum on the outer side of the descending colon having been incised and its edges brought up to the skin incision, the operation was completed retroperitoneally. The child left hospital ten days later in excellent health. Mr. Thompson said that this condition appeared mainly during the first seven years of life, both sexes were affected with equal frequency, and the right side as often as the left; occasionally it was bi-lateral. The clinical features in all cases were few and uniform—a progressive, painless swelling in the lower abdomen soon associated with an increasing constipation, and ultimately accompanied by emaciation. The condition was thought to be a sarcoma arising from the intrarenal adenomatous tissue which should have formed the convoluted tubules, but which, because of a poor blood-supply, failed to develop normally, and had taken on a tubulo-acinar formation. This had become sarcomatous, and the growth, obliterating the calyces and renal pelvis, prevented secretion from the affected organ, and thus explained the absence of hæmaturia, which absence was such a common feature in these cases. The operative mortality was high, and of the late cases the majority of those who survived operation rarely lived 12 months. This case made excellent progress for almost four months, when the patient contracted measles and died.

Dr. A. DINGWALL FORDYCE and Dr. NORMAN CAPON communicated a paper on

"Idiopathic" Hypertrophy of the Bladder.

Two cases of this condition were described and lantern slides of the pathological condition exhibited. The analogy with other apparently idiopathic neuro-muscular conditions was dwelt upon, and reference made to the literature on the subject. At the post-mortem examination the only pathological findings were hypertrophy and dilatation of the bladder, dilatation of the ureters and of the pelves of the kidneys, and cystic-like degeneration of the kidneys. There was no detectible cause producing the obstruction. The inference, corroborated by analogy, was that vesical spasm produced the local sequelæ, and that it in turn was secondary sometimes to obvious

nervous lesions and sometimes to nervous abnormalities which were not detected.—Mr. R. E. KELLY pointed out that the post-mortem picture of dilated bladder, dilated ureters, and dilated renal pelves showed a remarkable similarity to the condition found in adults with an enlarged prostate or a stricture of the urethra. The disease was limited to the male sex, and therefore the explanation that it was due to some neuropathic cause was a difficult explanation to accept. In his opinion there was obstruction. This obstruction was due to the constant and repeated blockings of the urethra by plugs of mucus. One had only to witness the pain, tenesmus, and straining in the living subject, followed not by a complete emptying of the bladder, but the passage of a small plug of mucus, to appreciate the enormous strain on the bladder. The increased tension inside the bladder produced the disease. It was a further example of the value of living pathology over observations made in the post-mortem room. In one case he had to withdraw a catheter two or three times, and remove a plug of mucus from the eye of the catheter before he was able completely to empty the bladder. For this reason it was found impossible to wash out the bladder per urethram, for even after repeated washings under an anæsthetic mucus could still be detected by the cystoscope. In his opinion suprapubic cystotomy was the best treatment.

ULSTER MEDICAL SOCIETY.

AT a meeting of this Society, held on Nov. 8th, with Prof. W. ST. C. SYMMERS, the President, in the chair, a discussion took place on

INSULIN IN DIABETES MELLITUS.

Dr. JOHN MILROY made a few introductory remarks on recent developments in the physiology of the internal secretion of the pancreas, especially in their relation to treatment.

Clinical Results.

Dr. SINCLAIR MILLER (Harrogate) spoke on some clinical results with the use of insulin in diabetes mellitus, in which he showed that insulin was a potent remedy in the treatment of this disease. The tedious period of preliminary starvation was no longer necessary and the patient was more rapidly relieved of his distressing symptoms. Within a short period of 24 to 48 hours the blood-sugar of a severe diabetic could be brought down to normal, and in a few days the patient began to feel the benefit of the treatment. The regulation of the diet was as essential as ever, or even more so. Insulin must be given by hypodermic injection as it was rapidly destroyed in the alimentary canal. Recently a method of inunction had been suggested, and it had been shown that insulin given in large doses by the mouth in an alcoholic solution had some effect. The successful treatment of diabetes with the aid of insulin called for the observance of the usual precautions—viz., the eradication of all foci of infection, the accurate control of diet, the maintenance of a normal blood-sugar percentage, the avoidance of over-nutrition, extreme under-nutrition, mental worries, over-exertion, infections, chills, &c., and a life consistent with the diet restrictions. Insulin and dietetic restrictions were unnecessary in renal glycosuria. In cases of glycosuria dependent on cancer of the pancreas or cerebral lesions no benefit could be expected from insulin.

The general practitioner might use insulin with hope of success, provided he had mastered the principles of diet, and had experience of the use of insulin, and that an occasional blood-sugar estimation could be carried out. Starting with small doses, say 5 units twice daily, the dose should be gradually increased until the urine became sugar-free. Severe cases, however, should be placed in a dietetic institution or hospital, and their treatment should last from four to six weeks. An initial fast accelerated the patient's progress. The patient should then be placed upon a diet calculated by allowing about 12 calories to each pound of body-weight, the protein being about half a grain per pound of body-weight, and the carbohydrate at first limited to 20 gr. The fat must be high to make up the proposed total of calories. The ultimate scale of dosage could only be arrived at slowly and by trial. Two injections could be given conveniently, the first half an hour before breakfast, and the other half an hour before the evening meal. If possible, the major portion of the carbohydrate allowed should be divided equally between these two meals. It was more important that food be taken after insulin than that insulin be given before food. After a few days on the basal diet and when the blood-sugar percentage had reached a satisfactory level the diet might be increased and the insulin decreased according to the needs of the patient. Instruction regarding diet and the mode of administering insulin must be given. Over-dosage of insulin produced flushing of the face, followed by pallor, sweating, sometimes faintness, a feeling of extreme hunger, a sense of apprehension, tremors, loss of the finer movements, and ultimately in some cases unconsciousness. There was little risk from hypoglycosuria in institutional treatment, but when the patient was in his own home he should be warned regarding the symptoms and instructed in their treatment, which consisted in administering 1 to 2 oz. of sugar in hot water by the mouth, and in case of unconsciousness an intravenous injection of about 100–200 c.cm. of a 10 or 20 per cent. solution of glucose. One c.cm. of 1 in 1000 adrenalin or 1 c.cm. of pituitrin might be effective in restoring consciousness.

The symptoms of over-dosage by insulin arose at very different levels of the blood-sugar percentage, but generally these symptoms occurred only when the blood-sugar fell below 0·08 per cent. Elderly patients might have a blood-sugar level far above the normal range and yet the urine might be sugar-free. The blood-sugar level was a safer index for treatment than glycosuria. It would seem that the continuous treatment of diabetes by insulin was necessary and the cost was heavy. It might run from £30 per annum in a mild case to £150 per annum in a severe case. In diabetic coma in the early stage insulin was almost a specific. The patient must be given a large dose, 60 units or more intravenously in moderate or severe cases. In milder cases hypodermic injections might be effective. Accompanying the administration of insulin 500 c.cm. of a 10 per cent. solution of glucose should be given. If there was any fear that the alkali reserve was low, 1 to 1½ oz. of sod. bicarbonate should be given. Coma was the result of ketosis, rather than of hyperglycæmia. Insulin assisted in the destruction of the ketone bodies as much as in the reduction of the blood-sugar level. Hence, glucose was given to prevent the risk of hypoglycæmia, and at the same time to supply an easily available source of fuel for the destruction of the ketone bodies. The speaker read notes of a series of illustrative cases.

Dr. J. A. SMYTH gave the results obtained in the treatment of 50 cases of diabetes mellitus with insulin at the Royal Victoria Hospital, Belfast. He dealt first with the definite diagnosis of the disease, especial reference being made to the use of glucose tolerance curves. In this connexion an account was given of two interesting cases of glycosuria recently seen—one due to injury of the pituitary body caused by fracture of the base of the skull, and the other due to a chronic cholangitis and hepatitis following on a gastro-jejunostomy. The treatment of diabetic coma as carried out at the hospital was described in detail, from the borderline cases to those which had been completely comatose for 24 to 36 hours. No case of coma had been lost. Of the cases of ordinary diabetes some had done exceedingly well, most had done well, but one or two had responded only to a limited extent. A detailed account was given of a few cases which presented especially interesting features. In many of them it was possible to demonstrate a greater or less degree of recovery of function of the islet tissue in the course of treatment allowing of a steady increase of carbohydrate in the diet, or a diminution of the amount of insulin.

Reviews and Notices of Books.

CARDIOLOGY.

Principles of Diagnosis and Treatment in Heart Affections. Second edition. By Sir JAMES MACKENZIE, M.D., F.R.S., LL.D. Aberd. and Edin., F.R.C.P.I. (Hon.), Director, St. Andrews Institute for Clinical Research; and JAMES ORR, M.B., Ch.B., Physician to the Institute. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 247. 7*s.* 6*d.*

IN the second edition of his popular small book on the heart Sir James Mackenzie has been assisted by Dr. James Orr. The book presents afresh the well-known features of the first edition; the subject-matter has been rearranged and one or two new paragraphs have been added. There is one small point in the chapter on heart attacks which calls for comment. The author uses the term "palpitation" to describe the condition more commonly known as "simple tachycardia." As palpitation is generally understood to mean consciousness of the heart's action and may be one of the most troublesome symptoms in paroxysmal tachycardia, the special use of the word is liable to lead to confusion. A critical review of the more recent researches on auricular fibrillation and flutter from the pen of so distinguished a pioneer in the investigation of the cardiac arrhythmias would have been very welcome, but in a book of this size and scope it is probably wise to exclude matter which is still at a controversial stage.

We do not doubt that the second edition will achieve as much well-deserved popularity as was enjoyed by the first edition.

Heart Records, Their Interpretation and Preparation. By S. CALVIN SMITH, M.S., M.D. Philadelphia: F. A. Davis Company. 1923. Pp. 313. $7.00.

IN the preface to his book Dr. Calvin Smith states that it is intended to be an "elementary guide" for those who wish to study graphic methods. He deals not only with the physiological basis and the interpretation of records, but also devotes several chapters to the various details of technique. The greater part of the book is concerned with electrocardiography, and the last two chapters refer to polygraphy and graphic methods in general. A highly technical subject such as electrocardiography may be approached from one of two aspects, either from that of the general physician, or from that of the specialist; and in endeavouring to meet the requirements of both parties the author has had difficulty in coming to a satisfactory compromise. The general physician wants to learn how to interpret records, and to know the extent to which electrocardiography is capable of helping him in the diagnosis, prognosis, and treatment of his cases. He does not want to read about the details of technique, nor the various troubles which the laboratory worker is liable to encounter. The specialist, on the other hand, must make himself master of his technique, and cannot do so without possessing an elementary practical knowledge of physics, such as can only be acquired in the laboratory.

To the novice Dr. Calvin Smith's book would be somewhat disheartening, for the author's ingenuity has enabled him to compile a truly remarkable list of possible mishaps and mechanical troubles to which the electrocardiographic method is susceptible. He appears hardly to have given his readers credit for the average amount of common sense. This faculty alone should be sufficient to prevent such mistakes as connecting the right-hand wire to the left-hand electrode, or mounting records upside down. Again, the young cardiologist who ventures to arrive at a complete clinical diagnosis by the use of graphic methods alone requires to be instructed in the general principles of medicine rather than cardiology; nor does the operator who gets into trouble through allowing "meddlesome persons" to tamper with his instrument deserve much sympathy. The chapter dealing with photographic technique appears to be somewhat superfluous for the average laboratory worker of the present day, and the book as a whole would be improved by being considerably shortened.

The "Nauheim" Treatment of Diseases of the Heart and Vessels in England. Sixth edition. By LESLIE THORNE THORNE, M.D., B.S. Durh., M.R.C.S., L.R.C.P. Lond. London: Baillière, Tindall and Cox. 1923. Pp. 232. 7*s.* 6*d.*

IN this book Dr. Thorne Thorne gives a detailed description of the special therapeutic measures employed, and discusses the benefit which may accrue from this line of treatment in various diseases. The author's particular thesis is, that the treatment can be given anywhere where there is a bathroom and a good supply of hot water, with results as successful as those obtained at Nauheim. Thus home treatment in England is available for many patients who would be physically incapable of undertaking the journey to one of the continental spas. So far as this part of his argument is concerned most physicians will be prepared to agree with Dr. Thorne, but when he comes to deal with the mechanism whereby the beneficial effects are obtained, he leads his readers on to much more debatable ground. Therapeutic deductions regarding even empirical treatment are beset with innumerable difficulties, and to attempt to go further, and to explain the mechanism of treatment on rational lines, is to enter a field where hypothesis requires to be supported by very detailed and conclusive evidence. That the "Nauheim" treatment does produce beneficial results in certain selected cases of cardiovascular disease few will doubt, but to assess the respective values of the different factors by which these results are produced is no easy matter. The influence of mind over body has received so much attention in recent years that some may be tempted to think that the pendulum has swung too far; but that there is an important psychological factor in spa treatment is unquestionable. Again, the carefully regulated routine to which the patient is subjected during a course of treatment is undoubtedly of considerable importance. Dr. Thorne appears to over-emphasise the therapeutic value of the baths themselves, and the evidence which he brings forward in order to prove his point is not convincing. For example, it is difficult to believe his statement that "a change of one degree in the temperature of the water, or a shortening or lengthening by one minute of the time of immersion . . . will often materially affect the result."

OPHTHALMIC SURGERY.

A Handbook of the Surgical Operations on the Eyeball and its Appendages as Practised at the I. Eye Clinic, University of Vienna. By Dr. JOSEF MELLER, Clinical Professor of Ophthalmology. Edited by Dr. WILLIAM M. SWEET, Clinical Professor of Ophthalmology, Jefferson Medical College, Philadelphia. Third edition, translated from the second (German) edition. London: William Heinemann. 1923. With 219 original illustrations. Pp. 365. 25*s.*

TWO methods of writing a text-book on any branch of surgery are possible. One is to give some account of all the operations which are or have been habitually practised, the other to select those which the author considers the operations of election, and describe them in sufficient detail to be a real help. The latter is the method of Dr. Meller.

The Vienna methods of operating are very much the same as those practised in London by surgeons who are moderately conservative, and the descriptions in this book and the excellent illustrations will be found useful by the young operator. The first operation described is excision of the lacrymal sac; 12 excellent figures materially assist the understanding of the letterpress. The importance of a careful study of this operation is great, as it is so often done incompletely with unsatisfactory results, a fact which

accounts for the introduction of the alternative intranasal operations. These are only briefly referred to. Next we have 90 pages devoted to lid operations. The use of skin flaps is well illustrated. For ptosis the operations described are that of Hess and that of Motais, probably the two which are most generally practised in this country. After a chapter on squint operations, enucleation of the eye under local anæsthesia is described. It appears that in Vienna a general anæsthetic is only used in the minority of cases. Krönlein's resection of the outer orbital wall is an operation for which many ophthalmic surgeons would call in the general surgeon, but the description in this book is no less serviceable on that account. A very detailed description of the ordinary (i.e., extracapsular) operation for the extraction of cataract is given. The only part of it which appears unusual is the position of the operator. It is the custom at Vienna to sit at the right of the patient who is lying on the operating table. The incision is made on the right eye with the left hand, on the left eye with the right hand. There is no mention of "washing out" the soft lens matter, even after the operation of linear extraction in young adults, so that presumably this process is not practised in Vienna. There is no mention either of Smith's intracapsular operation or of Barraquer's. This conservative tendency is also manifest in what the author says of sclero-corneal trephining for glaucoma—viz., that it would appear to be justified only in those cases of glaucoma in which the ordinary iridectomy cannot be performed without extreme difficulty or danger. Because of the possibility of late infection, the operation, he says, is not indicated in young persons or if the patient has only one eye.

While not in agreement with everything contained in this book, we can thoroughly recommend it as a good and clear account of the operative surgery of the eye from a teacher of high reputation. The illustrations are an important, indeed an essential, part of the book.

LIGHT AND COLOUR.

By R. A. HOUSTOUN, M.A., Ph.D., D.Sc., Lecturer on Physical Optics in the University of Glasgow. London: Longmans, Green and Co. 1923. Pp. 179. 7*s.* 6*d.*

DR. HOUSTOUN has written a very interesting book on light and colour. It is unusual, savouring neither of the text-book nor of that which merely seeks to catch the fancy, though dealing with those aspects of light and colour in which most popular interest is taken at present. How wide a variety these interests include is seen by a glance at the titles of the 11 chapters of the book. Dr. Houstoun wisely does not restrict this treatment to visible radiation; when occasion requires he initiates his readers into the characteristics of other parts of the electro-magnetic spectrum. The chapters on colour photography, colour-blindness, and the light of the future are essentially practical in their treatment. The last chapter is devoted to the psychology of colour, and will be to many a revelation of the effects which different colours may have upon the human subject, not so much perhaps upon body processes as upon the mental ones.

The book is well illustrated; the treatment of the subject is excellent throughout, and a very wide field of interest is covered without elaboration of detail.

BIOCHEMISTRY.

Handbuch der Biochemie des Menschen und der Tiere. Second edition. By many authors, under the general editorship of Prof. Dr. Phil. et Med. CARL OPPENHEIMER, in Munchen. Jena: Gustav Fischer. 1923. Parts 1 to 7. 4 to 7 pre-war marks each.

HERE we have seven discontinuous paper-backed parts of a symposium. Lieferung 1 stops in the middle of a sentence dealing with the pure chemistry of animal fats, whilst Lieferung 2 deals with the gases in the body. This may not be avoidable in the production of a large work of this nature, but it makes comment difficult. The work is to be completed in nine volumes which are to cover the whole field of animal and human biochemistry, the whole subject being treated more from the biological than the purely chemical standpoint. Only a comparatively small section is to be devoted to the pure chemistry of proteins, fats, and carbohydrates. This is a great advantage since the work does not in any way overlap such systems as Abderhalden's "Handlexikon," which is devoted entirely to the pure chemistry of natural products and their physiological properties. Each section is written by an authority and has been brought quite up to date. A series of references is appended to each chapter, and seems remarkably complete. It is impossible to enter upon a detailed review until more sections are completed. The first seven parts are uniformly good, and it is quite safe to say that, if this edition continues in the same manner that it has begun, it will become indispensable to anyone working in the subject.

JOURNALS.

JOURNAL OF INDUSTRIAL HYGIENE.—In the September issue H. L. Blumgart reports an investigation made to ascertain whether lead dust deposited in the upper air-passages is absorbed into the body. The experiments were carefully carried out on animals. White lead was sprayed intra-nasally after the œsophagus had been ligatured and a tracheal cannula had been inserted. The animals were kept alive for 24 to 36 hours. In every case lead was found throughout the tissues of the body, showing that it is absorbed from the upper air-passages rapidly and in excess of a minimal toxic dose. The conclusion is drawn that in industry lead dust may be absorbed intra-nasally.—Further observations on tetrachlorethane poisoning by D. C. Parmenter lead to the conclusion that persons exposed to the vapour of this substance show a definite blood picture and gastric symptoms easily recognised. He therefore considers that, provided proper precautions are taken and medical supervision enacted, tetrachlorethane can be used safely in industry.—A report appears upon an extensive investigation into the use of electric precipitation for quantitative determinations of dust in the air. The apparatus and methods employed are fully described. While electric precipitation of dust for this purpose has certain objections, nevertheless the method offers an efficient way of determining the dust particles present.——In the October issue an article by J. S. Sheppard deals with the employment of cardiac patients effected through an employment bureau. The result of regular work on this type of patient was found excellent, and his work tolerance was much greater than was expected before placements in regular industries were made and watched. The experience is held to justify the statement that well selected work will frequently help cardiac patients to improve and go from Class II. B to A, and that work in normal surroundings has a much better effect than work in segregation.—An investigation made in a glass bottle industry by J. P. Baumberger and E. E. Perry is of interest because they found that judgment of size of gobs of glass was dependent on Weber's law—i.e., that a certain percentage increase in the size of stimulus is necessary before the sensation of appreciable increase in size arises. The investigators suggest that in many cases in industry the limits of accuracy to be expected of workers could be determined on the basis of this law.—The most important contribution is one from B. S. Nicholson, who deals with the pathology and clinical aspect of silicosis and pulmonary tuberculosis. This article is the result of careful clinical observation while carrying out work under the Workmen's Compensation (Silicosis) Act, 1918. The author concludes that more persons than is generally thought die from silicosis without becoming tuberculous. He puts forward the suggestion that when tuberculosis is manifested the infection may have occurred when the dust particles were originally inhaled and have remained latent within a centre of silicotic fibrosis until a breakdown of scar tissue releases it, perhaps years later, to subject the tissues to a massive infection

THE LANCET.

LONDON: SATURDAY, DECEMBER 1, 1923.

THE GENERAL MEDICAL COUNCIL.

THE opening of the 118th session of the General Medical Council on Tuesday last, Nov. 27th, was presided over by Sir DONALD MACALISTER, whose devotion to duty must entail considerable personal sacrifice and whose recovery from his recent illness is a matter of great and common congratulation. The address from the chair, which was briefer than usual, took particular note of the position of the medical profession in India, where the conditions for the recognition of Indian medical degrees upon the British Register are attended with difficult and delicate circumstances. The Government has, however, placed Lieut.-Colonel R. A. NEEDHAM, I.M.S., on appointment by the Indian Government and with the approval of the General Medical Council as official inspector of Indian universities and colleges, on special duty in order that he may attend the meetings of the Executive Committee of the Council at this session to discuss all the questions. As Sir DONALD MACALISTER pointed out, and as is too often forgotten, there are two sides to these, as they refer to practice in India or practice in Great Britain. While as far as the first category is concerned the Empire of India may be considered autonomous, as regards qualifications for registration in this country Acts of Parliament compel inquiry into the qualifications for practice. Difficulties will arise, and have arisen, which are not readily capable of solution, and we are glad that the Council, owing to the valuable intervention of Sir NORMAN WALKER, will be able to obtain first-hand advice from Colonel NEEDHAM.

Most of the time of this session will be occupied in hearing cases of discipline under Section 29 of the Medical Act, 1858, and after the President's address the business of the Council was directed immediately to the hearing of these cases.

THE SUPPLY OF NURSES.

SOME three years ago Mr. E. W. MORRIS, house governor of the London Hospital, pleaded[1] for a thorough investigation of the reasons why women were not entering the nursing profession in sufficient numbers. The shortage of probationers of a type acceptable to matrons of hospitals still remains acute, and though in this country no steps have yet been taken to organise such an inquiry, the problem has been tackled with considerable skill and understanding in America by a committee appointed by the Rockefeller Foundation. The main outcome of the labours of this committee, a section of whose report we summarise on p. 1203 of this issue of THE LANCET, is their conviction that little improvement will result until the conflict is recognised and to some extent resolved, which at present exists between two of the functions of a modern hospital—viz., that of economic hospital administration, which aims at caring for the sick at minimum cost, and that of catering adequately for the educational requirements of nurses.

[1] THE LANCET, 1920, ii., 1293.

No one who studies carefully the documented evidence on which this conclusion is based can doubt its truth. Among the constructive suggestions to which it gives rise are: (1) That training schools should be under the direction of a board organised for the primary purpose of education, and (2) that adequate funds should be available not only for the educational expenses of the school itself, but also for the replacement of student nurses by graduate nurses and hospital help in the execution of routine duties of a non-educational character. It is idle for hospital administrators and senior members of the nursing profession to regret the days when nursing made a strong appeal to the highly-bred educated woman, who adopted it as a pious vocation rather than as a profession. These days will not return. The sane young woman of to-day differentiates clearly between her desire to serve the community and the need first to equip herself speedily and adequately to do so. Since many professions giving opportunities of service are now open to her, factors in her choice will, doubtless, include conditions of training which are not unnecessarily strenuous or autocratic, as well as prospects of reasonable remuneration, status, and employment when training is complete. While the difficulties of the authorities responsible for staffing hospitals with probationers of a type most likely to develop into reliable staff nurses and sisters receive universal sympathy, the point of view of other interested parties—the medical practitioner, the patient, and the nurse herself—have not always been treated with the same respectful consideration. May it not be that the leaders of the nursing profession have ideals for its development which rise above the effective demand of the average practitioner and patient, and moreover require a degree of intellectual ability which will not be satisfied by the conditions of work open to any but the very few?

This is a view which has influential medical backing. Among the Collected Papers of the Mayo Clinic for 1921[2] is a report of an address by Dr. C. H. MAYO to a hospital conference, in which he sharply criticised the conditions of training of the hospital nurse in this sense. He complained that the nurse who, having achieved a high standard of general education, has laboured diligently in hospital for three years, emerges overtrained as a nurse and undertrained as a physician. He contended that the requirements are too high for the average work demanded of the nurse after registration, holding that they should on the one hand be raised for those who are capable of acting as responsible technical assistants or specialists in various branches of nursing, and on the other hand that the period of compulsory training should be made shorter in conformity with requirements for general nursing. He suggested the reduction of the course of training to two years, with a third year of post-graduate study, which should be optional. This extra year should not necessarily follow directly on the early training, but those who wished to do so might be allowed to return to hospital at any time to qualify for higher service. "Chief nurse in the hospital, chief surgical nurse, nurse in dressing service, anæsthetist, county, city, and school nurse, industrial and child welfare nurse, dentist's aid, physician's aid, and laboratory technician" are among the positions suggested for those who have completed the advanced course.

The dual difficulty has received attention from the Rockefeller committee, who recognise it by the suggestion, which is more likely to find acceptance

[2] Collected Papers of the Mayo Clinic. Vol. XIII.–1921. Edited by Mrs. M. H. Mellish. London and Philadelphia: W. B. Saunders. 1922. Pp. 1318. 60s.

than that put forward by Dr. MAYO, of the formation of a subsidiary nursing service. To those who refuse to admit the need of any reduction in the standards required of one expected to attend to the sick, it may be pointed out that though we cannot fight disease with an army of privates, neither do we need an army of generals. That the distinction should be in the nature of the work undertaken rather than on economic lines will doubtless make the proposal less unpalatable to the nursing profession, which has not hitherto looked kindly on any suggestions of grading. As we pointed out last week in connexion with the establishment of convalescent hospitals for the double purpose of pre-hospital and post-hospital care, attention to an invalid who is not ill enough to be interesting is apt soon to become irksome. The boredom of the experienced nurse in charge of a chronic case, and her desire to leave such a post for one in which her technique has more scope, is an obvious corollary of the development of nursing education, but the wants of the subacute or chronic case are likely to suffer in the future unless some sort of subsidiary nurses are available. For these patients the economic question also is a serious one, in proportion as their illness is protracted. The letter which we print on p. 1220 gives expression to still another side of the difficulty. The problem here is the provision of nursing service which combines the minimum efficiency demanded by the doctor and the maximum remuneration in the way of accommodation and standards of comfort, as well as fees, that can be afforded by the patient. We trust, therefore, that serious consideration will be given to the section of the report which attempts to meet this need, as well as to that on the training of hospital nurses.

PUBLIC HEALTH AND THE ROCKEFELLER FOUNDATION.

OUT of the Rockefeller Sanitary Organisation for the Eradication of Hookworm Disease—planned and matured in the mind of Mr. JOHN D. ROCKEFELLER in 1909—there has grown the International Health Board of the Rockefeller Foundation, and before us we have the ninth annual report, covering the period from January to December, 1922.[1] With such success was the original plan carried out—involving a geographical survey of the distribution and intensity of the disease in the United States, the cure of its sufferers, and removal of the source of infection by avoidance of soil pollution—that in 1914 the chief purpose of this first Sanitary Commission may be deemed to have been accomplished. The success was such that in 1913 a permanent institution on a wider basis, the Rockefeller Foundation, was endowed by its founder with 100 million dollars. In the course of ten years of coöperative service, hookworm infection the world over has been measurably diminished, progress has been made towards reducing the ravages of malaria, and a relentless campaign is still being waged against yellow fever wherever its danger-flag appears.

From the outset it was fully recognised by the Rockefeller Foundation that public health is essentially a function of government, and that continued advance in preventive medicine throughout the world depends upon an adequate supply of skilled public servants. To further the investigation of epidemic diseases, the Foundation has promoted training schools for health officers, nurses, and visitors, and contributions were made towards the establishment of schools of public hygiene. With regard to the conquest of yellow fever, it is remarked that "no other infectious disease has been so completely subjected to human control as yellow fever, since the day when stegomyia was found to be its intermediate host." The epidemic of 1920, with about 20,000 cases in its train, was conquered in Peru by 1921.

An interesting map is given of the retreat of yellow fever in 1900–1922 in the Western Hemisphere. There must, however, be no relaxation of vigilance. Equally satisfactory results were obtained in British Honduras, Mexico, Guatemala, and Ecuador as the result of unceasing efforts to eradicate stegomyia. The means adopted and the successes gained in combating malaria "at home" are described. Abroad the fight has been taken up, in response to official invitations, in Italy, where malaria is the outstanding health problem of the country, for, as the report concisely puts it, "with approximately 2,000,000 cases a year, the disease is not only a vital factor in the life and health of Italy, but a matter of serious concern on the economic side as well." In the anopheles belt all the conditions favourable to the breeding of a singularly virulent and hardy type of mosquito (*Anopheles maculipennis*) exist, while unfavourable housing conditions, and the migratory character of agricultural labour, all conspire to create a problem of the first magnitude. It was decided to send a representative to Italy during 1923 to make a survey. The Board is also coöperating with the Government of Palestine in the investigation of various malaria problems in that country. A campaign against tuberculosis has been conducted in France since 1917. At the end of 1922 there were 421 dispensaries at work, of which 301 were created on the initiative and with the coöperation of the Board. An educational campaign was also conducted on a national scale, practically the entire administration of which is now in French hands.

As an object-lesson of the value of public health work no better example can be given than the splendid achievements in the control of hookworm disease—a menace which threatens more than half the world, for 900,000,000 people live in the areas of infection. This menace can only be dispelled by spreading knowledge of the disastrous consequences of the disease and by instructing the people in the elementary practice of hygienic living. The gratifying results already obtained, and the further measures taken to exterminate the disease in Columbia, Paraguay, the West Indies, Central America, and the Far East, are recorded in the report. A survey is now proposed for Spain on the invitation of the Spanish Government. Encouragement as well as monetary assistance has been given liberally for public health agencies both in the United States and abroad; more especially in Brazil, where also a public health nursing service is being created. Not the least of the Board's successful efforts has been the development of public health laboratories in the Western Hemisphere and its coöperation with the League of Nations in the coördination of efforts against disease. Moreover, by way of broadening the base of health work by education, the Board in the past few years has aided in establishing the Johns Hopkins School of Hygiene and Public Health, the Harvard School of Public Health, the Institute of Hygiene at São Paulo, Brazil. In the Old World the Board has given help to a similar Institute at Prague, and one at Warsaw, as well as contributing more than 2,000,000 dollars towards the School of Hygiene in London, the plans for which are just beginning to take shape. Further, as public health services cannot be created by the supply of funds alone, and in order to aid in the development of leaders in the field of public health, Fellowships have been granted to carefully-chosen individuals. Seventy-nine men and women from 19 countries throughout the world have been thus appointed to carry out research in public health work. Some of these have left our own medical schools within the last few weeks, and their future work is a matter of keen interest on this side of the Atlantic.

[1] New York: 61, Broadway.

THE ANCIENTRY OF MEDICAL ETHICS.

THE duty of the medical man towards his patient, his fellow practitioners, and himself has always been a matter of consideration, whether approached from the purely professional side or from that of the law; and if there exists no definite printed system of medical ethics to indicate conduct within the profession, it is because nothing more definite can be said than was said some 2000 years ago on an Eastern hillside. The code on which we act is founded mainly upon tradition for its details, but in spirit it relies wholely on the dictum that a man should do as he would be done by. It is useful to have recalled to our minds one of the best published codes of ethics in the English tongue—namely, the code drawn up by Dr. Thomas Percival, 1740–1804, of Manchester, wherein this spirit is fully recognised. Percival's work on medical ethics was first published in 1803, and is now known to few. However, Dr. CHAUNCEY D. LEAKE, of Madison, Wisconsin, has written an excellent little pamphlet[1] on the subject, giving a life of Percival and reprinting the code, the discourse on hospital duties being omitted on account of its length. Percival's career is set out at length in the Dictionary of National Biography. He was born at Warrington in 1740, studied medicine at Edinburgh, was made an F.R.S. in 1765, "because of his mathematical and philosophical learning," established himself in Manchester in 1767, and in 1778 was appointed physician to the Manchester Infirmary. It is interesting to note that he was among the first to call attention to the evils of the factory system, and especially to the abominable conditions of child labour. His code of ethics served as the model of that adopted in the United States, especially that put forth by the American Medical Association. Percival, of course, was not the first to formulate a code of medical ethics, as Dr. LEAKE records in his introduction. It is unnecessary to do more than mention the code of Hammurabi, the Hippocratic oath, and the regulations of Frederic II., A.D. 1224, while we may add to the instances given by Dr. LEAKE the advice laid down by Arnold of Villanova, Henry of Mondeville, Lanfranc, William of Salicet, and John Arderne a little later.

Percival's code, as given by Dr. LEAKE, is in four chapters. The first deals with professional conduct relative to hospitals and other medical charities, the second with that in private or general practice, the third with the conduct of physicians towards apothecaries, and the fourth with professional duties in certain cases which require a knowledge of the law. The code is in every way admirable, and may be studied with advantage by medical men to-day, although Section No. 3, dealing with apothecaries, is of course out of date; the apothecary whose services our grandfathers spoke of as "using the 'potticary'" has passed away, except in so far as some of his duties are performed by the general practitioner. The code is written in dignified eighteenth-century English, and is full of delightful paragraphs. We may quote from Paragraph VII. of Cap. I., dealing with the assistance which a medical man may give a hospital patient in making his will. "It is one of the circumstances which softens the lot of the poor, that they are exempt from the sollicitudes attendant on the disposal of property. Yet there are exceptions to this observation . . . ." The late Lord Bowen must, we think, have been acquainted with Percival's dictum when on rising to his feet after dinner he began thus: "It must have been no small solatium to the prophet Daniel under the somewhat trying surroundings of the lions' den, to be able to reflect that when the dread banquet was at an end, he would at least be free from the sollicitudes attendant on the responsibilities consequent upon having to return thanks."

[1] Percival's Code: A Chapter in the Historical Development of Medical Ethics. By Chauncey D. Leake, Ph.D. Reprinted from the Journal of the American Medical Association, August 4th, 1923. Pp. 76.

Annotations.

"Ne quid nimis."

RESPONSIBILITY OF THE CRIMINAL LUNATIC.

THE current law, practice, and procedure, relating to criminal trials in which the plea of insanity is raised as a defence has been subjected to more or less criticism for nearly a century, such criticism reaching a peak in 1843 and in 1923, following the acquittal on grounds of insanity respectively of McNaghten[1] and Ronald True. Each of these trials aroused public feeling, and each was followed by an official attempt to investigate the sanctions on which the law was based and interpreted. The famous McNaghten rules were the outcome of one inquiry, and the report issued this week of the committee, constituted in July, 1922, by the Lord Chancellor, may prove the thread on which a pronouncement of hardly less importance will ultimately crystallise. The committee consisted of Lord Justice Atkin (chairman), Sir Ernest Pollock, Sir Leslie Scott, Sir Herbert Stephen, Sir Richard Muir, Sir Archibald Bodkin, Sir Edward Troup, Sir Ernley Blackwell, and Sir Edward Marshall-Hall, and the reference was as follows: To consider what changes, if any, are desirable in the existing law, practice, and procedure relating to criminal trials in which the plea of insanity as a defence is raised, and whether any and, if so, what changes should be made in the existing law and practice in respect of cases falling within the provisions of Section 2, subsection (4) of the Criminal Lunatics Act, 1884. The difficulties of the committee in arriving at their report were not lessened by the divergence between the views presented for their consideration by the British Medical Association and by the Medico-Psychological Association. It is the proposals of the first-named association with which the committee is in substantial agreement, and these are in the main conservative, favouring the retention of the existing law with certain modifications. The report of the Medico-Psychological Association, which would substitute other questions for the jury than those now submitted, was set out in full in our issue of April 7th last. The rules proposed by this body would, it is contended, throw upon the prosecution the onus of establishing that the insanity said to exist was not calculated to influence the act complained of, and, in default of the discharge of such onus would compel the court to order the accused to be detained during His Majesty's pleasure. In the opinion of the committee the effect of this change of procedure must be to transfer many inmates of prisons to criminal lunatic asylums, and to bring within the portals of the latter many persons who are now, without any public disadvantage, placed under the care of relatives. We reserve detailed comment on the findings of the committee, while welcoming its report as voicing the legal aspect of an admittedly difficult problem. The distinction between sanity and insanity, between grades of mental incapacity, and its bearing on responsibility for antisocial acts, has become less easy to draw as our knowledge of mental processes widens. It is not without significance that medical opinion was divided, and it is possible that the coöption of one or two medical members on the committee would have been helpful. We are to this extent in agreement with a conservative attitude at the present time—that the law works slowly, and that in the near future our ideas on psychiatry in the light of the more recent advances in psychology are likely to undergo drastic revision. The report of the Medico-Psychological Association, while it may not prove acceptable as a basis for immediate change in legal procedure, may well point the direction in which this change is likely to occur.

[1] It is odd that the most diverse spellings of this name should occur in different, and sometimes in the same, legal or medical text-books. We have previously adopted the form M'Naughton, which is that given in "Reports of State Trials," New Series, 1892, vol. iv. (1839–1843). We now follow that of the official report.

BACTERIA DIGESTING CELLULOSE.

THE problem of the digestion of cellulose by man and animals is one of great interest, since it has shown that as much as 90 per cent. of ingested cellulose may disappear in the human intestine, whilst, on the other hand, it is well known that the digestive juices do not act upon cellulose. Consequently, attention has been directed to the influence of micro-organisms upon this capriciously resistant substance. Omelianski has especially studied the bacteria which attack cellulose, and has isolated two varieties, both anaerobic and both morphologically similar, but distinguished by the fact that one produces methane in abundance, whilst from the fermentation occasioned by the other hydrogen is liberated. Recently, at the suggestion of Weinberg, Mme. Y. Khouvine[1] has succeeded in isolating a similar organism from the human intestinal tract. This organism, which she designates the *B. cellulosæ dissolvens*, is an anaerobic, sporing bacillus which has extremely limited conditions of growth, and shows a slow but definite ability to digest cellulose with the production of carbon dioxide, hydrogen, alcohol, and various fatty acids. Curiously this organism, which can break down so complex a molecule as that of cellulose, appears quite unable to utilise the simple carbohydrates and sugars for its nutrition, or even to attack these when they are present along with cellulose. This specialisation with regard to the food requirements of the organism is of some interest in connexion with its rôle in the intestine, since the work of Mme. Khouvine would show that it liberates from cellulose substances having a certain food value without disintegrating other substances of this kind which may be present in the surrounding medium.

HYGIENE IN GIBRALTAR.

HYGIENE in Gibraltar is something of a special problem, for, while the total area of the territory is 1387 acres, that of the city is only 104 acres, and the population as estimated by the police at the end of 1922 consisted of 16,182 British subjects and a floating population of 1145 aliens. To these are added between morning and evening gunfire a daily visiting population of some 10,000 aliens and 1500 British subjects resident in La Linea. Major G. S. Parkinson's report for 1922 sets out the difficulties and how some of them have been met. There are three kinds of water-supply—namely, rain-water for drinking purposes, a brackish water for street flushing and sanitary purposes, and well-water for the shipping. Drinking-water is obtained from roof catchment areas by occupiers and stored in underground tanks. The city council have catchment areas and reservoirs in the Upper Rock, from which they supply the public and shipping after purification by 15 days' storage. At the beginning of June, 1922, the underground tanks of the houses became exhausted and supplies were obtained from Algeciras in tank boats. Samples of water from wells in La Linea were submitted but did not come up to the required standard. Many additional water vendors were licensed, a regulation being made for all water vendors to wear a brassard stamped with their registration number. The price of the drinking-water to shipping is 2*s.* per 100 gallons, to private houses 1*s.* 3*d.* per 100 gallons. Schemes for improving the catchment areas are under consideration, which will entail considerable outlay. There is a constant supply of brackish water laid on to every house for sanitary and general purposes. The water carriage system in force worked well during the year. Gibraltar has its housing problem also. A scheme for building 12 tenements was abandoned because the rentals would not have been economic. Much progress has, however, been made in getting existing houses into a better state of repair. Major Parkinson deals at some length with the high death-rate from pulmonary tuberculosis and its connexion with bad housing. He instances a case of eight persons living in one room, two being affected by pulmonary tuberculosis, one in an advanced stage. The campaign against street spitting often meets with derision from unenlightened quarters. Attention is being given to the schools. The flat roof of one school is used for open-air classes, for which the climate is well suited. A nursing sister from the Colonial Hospital visits the schools in turn and recommends for hospital treatment such children as seem to need medical attention. Unqualified midwives still flourish in the city, but steps are being taken to put an end to their employment. Of certified midwives there are at present seven in practice. The maternity ward at the Colonial Hospital does not as yet attract the class of woman for whom it was opened—viz., the poor woman living in bad surroundings, the usual reason given being that she cannot leave the other children. A beginning has been made with a child welfare centre, at which the attendances were one-third more than in the previous year and the opening of the new children's ward at the Colonial Hospital fills a long-felt want. The infant mortality-rate for the quinquennium 1918–22 was 113·2, as compared with 107·5 for the five years 1908–12. In spite of various relief works, the year 1922 was a hard one for many families on account of unemployment, and a supplementary grant of £700 was allotted by the Colonial Government to the Destitute Sick and Tuberculosis Scheme. In all 179 families received outdoor relief in the form of food tickets for meal and milk as against 158 families in 1921. The nurse appointed under this scheme paid 630 visits to sick people. The Gibraltar Home for Sick and Aged was full (54 inmates on Christmas Day) and its arrangements have been improved. An outbreak of rabies in the kennels on the North Front necessitated the destruction of all the hounds. The Muzzling Order was in force from March till October and, rabies being also reported at La Linea, restrictions were placed on the introduction of dogs. Inquiries elicited a reply from the Pasteur Institute that the preventive inoculation of dogs is as yet only in the experimental stages. The city council have enacted that all applicants for employment under their administration must be medically examined, and the procedure for the treatment of injured workmen at the Colonial Hospital has been greatly simplified.

MEMBRANOUS CONJUNCTIVITIS.

FROM the current *Bulletin* of the Ophthalmological Society of Egypt we learn that an epidemic of what was diagnosed as true diphtheritic conjunctivitis took place at Assiout last August and September among babies suffering from acute purulent ophthalmia. The infection was always mixed, and in no case could the diphtheria bacillus be demonstrated on smear preparations from the conjunctiva. Nevertheless, in 22 cases cultures proved that the disease was actually caused by the diphtheria bacillus. In a paper by Dr. A. F. MacCallan and Dr. Rasheed Bey the opinion is expressed that no reliance can be placed on the results of microscopical examination of smear preparations from the conjunctiva as regards the causative condition in suspected cases of diphtheria. It is essential to make cultures from the membrane if possible, or from the discharge. The growth on blood serum of typical colonies containing a bacillus which is morphologically identical with the diphtheria bacillus affords strong presumption that the case is actually one of diphtheria. It is, however, only by the isolation of the bacillus in pure culture and experimentation on the effect of injection into guinea-pigs that complete certainty can be established. This was done in four of the 22 cases. In only one of these cases was the conjunctival affection accompanied by faucial or nasal diphtheria; none of the cases was followed by paralysis of accommodation (it is not stated whether

[1] Digestion de la cellulose par la flore intestinale de l'homme: *B. Cellulosæ dissolvens*, n.sp. Mme. Y. Khouvine, Annales de l'Institut Pasteur, vol. xxxvii., No. 8, August, 1923.

paralysis of the external eye muscles was noted). Sixty-three per cent. of these cases had ulceration of the cornea, and in half the cases one or both eyes were lost. As the clinical condition of the eyes may be exactly the same in membranous conjunctivitis whether it is due to the diphtheria bacillus or not, it is advisable to give one dose of the antitoxin without waiting for the bacteriological report, and in cases of doubt this should be repeated for some days, but as in real diphtheritic cases one of the effects is the rapid disappearance of the membrane, if this does not happen the probability is that the case is not diphtheritic. The important question arises when a case of membranous conjunctivitis comes to the surgeon whether it is advisable to isolate it. These authors, taking into consideration the uncertainty of clinical diagnosis, recommend that this should be done pending bacteriological proof. Another important prophylactic measure necessary in Egypt is to treat the patient in a fly-proof room or tent.

Comparing this Egyptian epidemic with the cases reported in England—the late Mr. W. H. H. Jessop,[1] in 1902, reported 13 cases of membranous conjunctivitis, of which eight may be considered to have been proved to be diphtheritic, three of them indisputably so by the injection of products of culture into a guinea-pig. As far as the diagnosis between diphtheritic and non-diphtheritic cases goes, the membrane, he says, can in no way settle the point, the slighter cases being exactly alike. In only one of these cases was the eye lost, and most of them made a complete recovery. In the same year[2] Mr. Sydney Stephenson reported 43 cases of conjunctival diphtheria seen among 3412 out-patients, so that the affection, in his experience, is not such a very rare one. In every case the Klebs-Löffler bacillus was demonstrated, associated with other micro-organisms in about half. Antitoxin was administered in 23 cases, and of the whole series all but one recovered.

IS PRIMARY NON-GONORRHŒAL URETHRITIS COMMON?

WHEN, in a case of acute urethritis evidently not due to chemical or mechanical factors, gonococci cannot be found in the discharge, it may be difficult to make a definite diagnosis. A recent paper by Dr. E. Björling,[3] of Malmö, raises the question with which this annotation is headed, and answers it emphatically in the negative. He argues that when such cases of primary, so-called "non-gonorrhœal urethritis" are scrutinised and the history of the case is carefully investigated, evidence can almost invariably be found pointing to a comparatively recent or old infection with gonorrhœa. He has collected all the 18 cases of primary "non-gonorrhœal urethritis" in the male that he has seen within the last few years, and he has come to the conclusion that in none could the diagnosis of gonorrhœa be eliminated. He maintains that, now and then, a man may suffer from acute gonorrhœa without knowing of its existence; he may not be conscious of it till an acute posterior urethritis sets in with its usual discomforts, and if he escapes this complication, the attack may pass off and temporary recovery may occur without his knowing that he has suffered from gonorrhœa. Some years ago Dr. Waelsch described a urethritis which he regarded as non-gonorrhœal, both because the bacteriological evidence was negative and no history of gonorrhœa was forthcoming. Dr. Björling notes that the cases recorded by Dr. Waelsch presented many features characteristic of his own cases. In both groups the urethritis was remarkably refractory to treatment. This refractoriness can, to a certain extent, be explained by the assumption that the source of infection may be an undiagnosed case of gonorrhœa with which the patient continues to be in contact. Dr. Björling's paper is a sobering corrective to the attitude, still adopted in some quarters, according to which, when gonococci disappear from the discharge, the disease is regarded as cured. There are, unfortunately, conflicting views on this point. According to some authorities the so-called post-gonorrhœal catarrh—i.e., urethritis persisting after an attack of gonorrhœa, and without demonstrable gonococci—is not infectious. Dr. Björling and others regard this standard of recovery as far too lax, and his carefully annotated case records show that gonorrhœa may run a curiously subterranean, latent or symptomless course, digging itself in unobtrusively, and troubling the patient only after a long interval. A further lesson of Dr. Björling's paper is that many an obscure case of urethritis can be traced to the gonococcus if the physician takes the trouble to examine the partner with whom the patient is cohabiting.

[1] Trans. Ophthalmological Society, 1902.
[2] Ibid.
[3] Acta Dermato-Venereologica, 1923, vol. iv., Fasc. 2.

PARATHYROID TETANY.

WHEN the parathyroids are completely removed, the result in the experimental animal is rapid death with acute symptoms, which generally takes the form of tetanic convulsions. Some experimenters hold that the function of the parathyroid is to render inactive certain toxins formed elsewhere in the body, in particular the decomposition products (amines) resulting from bacterial action on proteins in the intestine. An American physiologist, Mr. R. Lester Dargstedt, has recently conducted further research on this subject, of which an account is given in the current issue of the *American Journal of Physiology*. His experiments were made on dogs and he found that if the parathyroids were completely removed the animals remained alive for at least a year provided their diet contained a large amount of lactose. In pregnant animals, however, the lactose diet is ineffective, as those animals died of tetany, perhaps because the poisonous substances were absorbed by the uterus. If dogs, with parathyroids removed, were fed for six weeks on milk-sugar diet and then fed on ordinary diet they remained healthy. Perhaps other organs—e.g., the liver—take up the function of the parathyroids and compensate for their absence. This suggestion is made because if in these animals the liver is injured by poisoning with phosphorus, tetany develops. Animals deprived of their parathyroids are particularly susceptible to the onset of tetany. The administration of much flesh food, constipation, muscular over-exertion on a warm day, or infections of various kinds may excite its onset. Such animals are also much more susceptible to the action of spasm-producing poisons.

THE ERADICATION OF TUBERCULOSIS IN CATTLE.

A WELL-REASONED article by Prof. B. Bang, of Copenhagen, in the last issue of the *Journal of Comparative Pathology and Therapeutics* tells of 24 herds in Denmark which were freed from tuberculosis at small cost and not a few farmers rescued from the verge of bankruptcy by the measures Bang advocates. The principle of his method is to separate diseased from healthy cows by means of the tuberculin test, to isolate each group, and then to add, on birth, all calves of tuberculous cows to the healthy herd and to get rid of their tuberculous mothers. To save time the intracutaneous application of tuberculin is coming into favour. The reason for this plan is that calves are almost invariably healthy when born. They are brought up on their mother's colostrum on the first day, and later either on raw milk from healthy cows or on milk heated sufficiently to destroy tubercle bacilli. One of the farms successfully cleared up by this method was that which sent a supply of milk for infants—i.e., certified milk—into Copenhagen. Applications twice yearly of the tuberculin test to the healthy section have to be kept up to prevent introduction of the disease and to get rid of reactors. The fairly numerous cases statistically and narratively given by

Bang show that by this method, used with care and perseverance, even badly infected herds may be cleared up in a few years and a healthy stock produced. It differs from "the accredited herd plan" prevalent in America in that there all reacting animals are slaughtered, some compensation being given by the State. Bang's method is more economical and he shows that it can produce very excellent results; 1676 herds, comprising 47,627 cattle have been tested. This isolation method has given very great satisfaction also in Sweden, Finland, and Hungary. The query remains as to what becomes of the tuberculous cattle that are sold? Bang's article does not tell us. But this is a most important point. If the buyer is not under an obligation to slaughter forthwith, the transaction, from the prophylactic point of view, is somewhat like borrowing from Peter to pay Paul.

INTRAVENOUS INJECTION OF CAMPHOR.

CAMPHOR as a circulatory stimulant is in much greater esteem on the continent than in this country. Subcutaneous injections have long been used, especially for children, but it is only recently that it has been shown that camphor oil can with impunity be injected directly into the circulation, and that the reaction is immediate. The stimulating effect on the circulation of camphor oil given intravenously has recently been emphasised by Dr. Erich Schilling,[1] of Küchwald, in Chemnitz. Dr. Schilling has used camphor in this way in all cases of marked collapse. In particular has he found it useful in cases of poisoning, his material comprising some 45 cases. It is especially indicated in coma, following gas-poisoning, as illustrated by the following case: A girl was brought in who had lain for three to four hours in an atmosphere of gas. She was completely unconscious, and reacted only slightly to stimulation of the skin. Three minutes after injection of 1 c.cm. camphor oil she opened her eyes, sat up, asked where she was, and answered clearly all questions put to her. In only four cases, two of morphia and two of gas-poisoning, was no effect obtained with camphor. Even if it is granted that the majority of cases of gas-poisoning recover without any treatment, yet from Dr. Schilling's experience it is clear that consciousness returns much sooner after the use of camphor and thereby the danger of inspiration pneumonia is considerably decreased. Although consciousness is usually regained after the first injection, in severe cases the treatment may have to be repeated two or three times at intervals of six hours.

INCOME-TAX EXEMPTIONS IN THE DOMINIONS.

A RECENT publication[2] issued by Somerset House gives a wealth of information regarding Income-tax rules in different parts of the Empire. So far as has been observed, the only places in which there are special rules which have a direct interest for the medical profession are the Tanganyika Territory and the State of Victoria. The African colony has a primitive ring in its name, but its tax code is from the medical standpoint a model to the world. Perhaps the very existence of an Income-tax proves distinct progress in civilisation, and a code that absolutely exempts from taxation all profits from the practice of the profession of licensed medical practitioner or dentist, and from the sale of drugs and surgical, medical, or dental appliances to the practitioner's patients has obvious merits to our eyes. These are the only professions so selected for legislative grace, not even the church sharing in the distinction, which is surprising, for there are one or two Dominions in which clergymen are exempt. It will be understood that this Tanganyika concession is unconditional (except for the "licensed") and unlimited as regards amount of income. In Victoria, Australia, among the deductions allowed in bringing out the taxable income, in cases where the total income does not exceed £800, are payments in respect of the illness (including surgical treatment) of the taxpayer himself, his wife, or any of his children under the age of 21, to (1) any legally qualified medical practitioner or any public or private hospital, (2) any nurse, (3) any chemist. Dental treatment is not mentioned. There is a limit of £2 under each of these three heads, but that does not mean that not more than £2 will be passed, but on the contrary that, if the total expenditure on any one of those heads (we understand for one illness) *does not exceed* £2, it must be ignored. This is a novelty in Income-tax legislation. The next allowance in Victoria embodies another new idea—namely, £20 for the funeral of the taxpayer's wife or any minor child, but not of the taxpayer himself.

[1] Deutsche med. Wochenschrift, Nov. 2nd, 1923.
[2] H.M. Stationery Office. Price 5s.

AGAR-AGAR.

Agar-agar is an interesting substance, although little appears regarding its properties in current manuals of materia medica. The U.S. Pharmacopœia, in which it is officinal, describes it as the dried mucilaginous substance extracted from *Gracilaria* (*Spærococcus*) *lichenoides* Greville and other marine algæ growing along the eastern coast of Asia, particularly several species of *Gelidium*, or *Gloiopeltis* (Class Rhodophyceæ). For many years these algæ have been used in the Far East under the various names of Ceylon moss, Japanese isinglass, and Javan alga for the preparation of foodstuffs, drugs, and adhesives. A decoction of these plants forms a jelly-like fluid, known as agar-agar, employed largely in some parts of Europe as a substitute for gelatin in the arts. The use of agar-agar in the preparation of bacterial culture-media is sufficiently familiar. It is noteworthy that a solution containing 0·5 per cent. of agar possesses the same adhesive strength as one containing 3 to 4 per cent. of the ordinary animal or fish glue. Commercially it is prepared by heating algæ in water in an autoclave at 120° C. for some hours; the viscous fluid is filtered while still hot, and the filtrate, after solidifying, is cut into strips. Gelatinisation, which does not take place unless the agar content is above 0·1 per cent., is due to gelose, a carbohydrate first described by Payen, who showed that a hot solution was coloured yellow by iodine, the colour changing to purple on cooling, and to blue on the addition of a few drops of H_2O_2. Gelose also reduces ammoniacal silver nitrate solutions on boiling. Agar dissolves completely in concentrated HCl or H_2SO_4; it is insoluble in glacial, but readily soluble in dilute acetic acid. Through the action of alkalies its solutions cease to gelatinise, but become much more adhesive; addition of borax gives the maximum amount of tenacity. Agar solutions do not reduce alkaline copper solutions except after prolonged boiling, and with most samples it is necessary to induce hydrolysis with H_2SO_4 before Fehling's solution can be reduced. No furfural reaction is given on heating with concentrated H_2SO_4. Agar is distinguished from gelatin by the fact that a precipitate results on the addition of sodium meta-phosphate to a boiling solution, while with gelatin there is no precipitate. Tannic acid precipitates agar from its solutions, but the precipitate redissolves on heating. Analysis of agar-agar has revealed the following constituents: 1. Carbohydrates: gelose. 2. A colloidal glue-like substance. 3. Starch. 4. A series of carbohydrate bodies such as pararabin, metarabin, xylose, and cellulose, all of which yield sugar on hydrolysis with dilute acids. 5. A slime soluble in water and of unknown constitution. Gelose is undoubtedly the most important of the constituents. This body was at one time thought to be identical with pararabin, but this can be disproved by the fact that on hydrolysis gelose yields galactose whilst pararabin does not. The provisional formula $C_{24}H_{38}O_{19}$ (i.e., $4C_6H_{10}O_5—H_2O$) has been allotted to it. Pharmacologically little is known about agar-agar. It is used in the East to

a limited extent as a food, although according to Saiki the human digestive tract is able to utilise but a very small percentage of the food value. Administered by the mouth it is stated to reduce the coagulation-time of the blood. Gelose is said to draw water into the gut and hence to act as a saline purge. Certainly by absorbing water from the stomach and increasing the bulk of the intestinal contents it acts as a laxative, a dose of 8–15 g. being employed for the purpose. A powerful anaphylatoxin results from digesting agar with guinea-pig serum. Finally, since marine algæ are continually discharging agar into the sea the question has been raised why it does not accumulate in the sea-water. The answer is apparently that sea-water contains bacteria which are capable of digesting it. Much information about agar-agar is contained in Abderhalden's useful "Biochemical Lexikon."

SCIENCE IN THE KITCHEN.

THE French have always placed the good cook among the artists, and now, it would appear, they would make him a scientist too. The Under-Secretary of State for Technical Education in France has decided to patronise the Scientific Society of Alimentary Hygiene, and thus, supported by the Government, classes have been organised for teaching the "higher culinary arts." To boil a potato or to grill a chop hardly calls for a specialised medico-chemical training, and yet doubtless when the chef aims to strike some harmonious gastronomic chord, chemistry should decide what is wholesome, while medicine may indicate the particular requirements of the invalid. The State lecturer, it may be presumed, will deal with the hygiene of food, with the technique of cooking, and with the preparation of dishes to meet invalid needs. He will also be informing on the purchase of foodstuffs, but if here he can teach the French housewife anything he will be a wondrously well equipped man. The staff of instructors includes Dr. Hemmerdinger, an experienced lecturer on domestic economy; Dr. Henri Labbé, professor in the Faculty of Medicine at the University of Paris; and Mr. Martel, member of the Academy of Medicine and director of veterinary services under the Prefecture of Police; and we see here indicated three main directions of instruction outside the ordinary cooking lesson, the hygienic claims and the need for thrift being considered and some knowledge of substituted foodstuffs being imparted. The classes will meet in the forenoon every Thursday, at 2, rue Clotilde, Panthéon (5e), and pupils are to be enrolled at the offices of the Scientific Society of Alimentary Hygiene, 16, rue de l'Estufade, Panthéon (5e).

THE Thomas Vicary Lecture will be delivered in the Royal College of Surgeons of England by Sir Arthur Keith, F.R.S., on Dec. 7th, at 5 P.M., the subject being the Life and Times of William Clift, First Conservator.

THE collection of drawings of war injuries of the fundus oculi, presented by Dr. W. Wallace, late Temp. Captain, R.A.M.C., to the Army Medical War Museum, is now available for study at the museum of the Royal College of Surgeons of England.

DONATIONS AND BEQUESTS.—During the past month the Royal Manchester Children's Hospital has received subscriptions and donations amounting to £852, including £200 from deceased benefactors, and £200 from the Salford Corporation.—By the will of the late Mr. James Mackersie, of Randolph-gardens, Broomhill, Glasgow, the testator left, among other bequests, £2000 to the Royal Infirmary, Glasgow; £2000 to the Western Infirmary, Glasgow; £2000 to the Victoria Infirmary, Glasgow; £500 to the Glasgow Benevolent Society for the relief of the destitute sick and those in extreme poverty; £250 to the Princess Louise Scottish Hospital for Limbless Sailors and Soldiers; £250 to St. Dunstan's Hostel for Blinded Soldiers, Regent's Park, N.W.; and £250 to the Royal Hospital for Sick Children.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XLVII.—TREATMENT OF COLLES'S FRACTURE.

THE classical fracture involving the lower extremity of the radius described long ago by Colles, of Dublin, is a relatively uncommon type of injury. But the term Colles's fracture to-day is held to include most complete fractures of the radius located within an inch of the lower articular surface of this bone. These fractures are seen at all periods of life, but are frequently sustained by elderly females. Before the age of 20, a separation of the lower epiphysis of the radius is the equivalent of the fracture of later life. In most instances a Colles's fracture is produced by a fall on the outstretched hand, the point of impact being the palmar aspect of the fully extended wrist. A compressing force is transmitted upwards and the radius breaks across at its weakest spot. Less commonly the back-fire of a motor starting handle may wrench off the lower end of the radius, but the most frequent radial back-fire lesion is a crack running through the site of the old epiphyseal line.[1]

The line of a Colles's fracture is roughly transverse. Impaction almost always occurs, but gross comminution is rare. The displacement of the lower fragment is largely determined by the direction of the transmission of the violence, and occurs in three planes: (1) The lower fragment is forced upwards and backwards en masse, and becomes jammed into the cancellous tissue of the shaft. (2) This fragment is deviated radialwards, and with it the hand. (3) A rotation occurs on a transverse axis, a hinge-like movement, so that the articular surface now looks downwards and backwards instead of downwards and forwards. The styloid process of the ulna is subjected to great strain, and finally fractures at its tip. Sometimes the attachment of the triangular fibro-cartilage to the base of the ulnar styloid is torn through, allowing an undue amount of separation between the lower ends of the two forearm bones. Often no appreciable deformation is recognisable.

Clinical Features.

Within a few hours considerable swelling develops in the wrist, dorsum of the hand, and lower third of the forearm, and may mask any slight bony deformation; if crepitus cannot be demonstrated, a fracture may not easily be recognised. A displacement, such as the "dinner-fork" deformity of the older text-books, is rare; usually the signs suggest little more than a severe contusion or strain. Comparison of the injured limb with its fellow of the opposite side allows minor degrees of displacement to be appreciated. These include (1) a radial deviation of the hand; (2) a palpable swelling involving the region of the lower fourth of the radius with a loss of the normal anterior concavity of this bone. This change in shape depends on (*a*) the projection of the lower end of the shaft on the flexor aspect of the wrist, and (*b*) the projection of the backwardly displaced lower fragment on its extensor aspect. The overlying tendons add to the localised bulge in both areas. Crepitus may be elicited in unusual cases, but is generally absent. (3) The radial styloid process may be displaced slightly upwards so as to be on the same level, or even higher than its fellow bone. The absence of a relative alteration in the position of these points does not contra-indicate the diagnosis of fracture. (4) The rounded lower end of the ulna is abnormally prominent. A radiogram, which should be taken without delay, will confirm the diagnosis and disclose the extent of the fracture and the plane of displacement. After 24 hours the swelling of the soft parts may rapidly increase, particularly in elderly people. The fingers become swollen and of a sausage shape, and the whole region is exquisitely painful and tender.

[1] Bizarro: Surg., Gyn., and Obstet., May, 1922.

The skin often becomes glossy, and the fingers and wrist-joint lose mobility. In younger individuals this picture is characteristic of the neglected case.

The whole of the upper limb should be inspected and palpated, as a contusion of the shoulder-joint may be produced by the same force that caused the fracture, and may be overlooked until the development of stiffness and pain many weeks later indicate the existence of a traumatic periarthritis or actual adhesions within the joint capsule. A fracture of the *scaphoid* may be produced by the same type of violence as a Colles's fracture. The two lesions may occasionally coexist. Signs which in themselves suggest a scaphoid lesion are (*a*) swelling and tenderness located to the scaphoid area (the anatomical "snuff-box"); and (*b*) pain elicited by abducting the thumb or extending the wrist.

Recent Impacted Cases with Obvious Deformity.

In every Colles's fracture, with displacement seen within the first few hours of the injury, complete and perfect reduction should be aimed at. In non-impacted cases, where there is gross displacement, reposition may sometimes be obtained with ease. But where impaction with deformity is present, considerable force may be needed to correct the displacement of the lower fragment. Under such circumstances it is wise to have the patient fully anæsthetised. Disimpaction without an anæsthetic is a manœuvre for the expert fracture surgeon only.

(*a*) *Reduction.*—The traditional method of reduction—often called the "hand-shaking" method—where an indirect force is utilised, is open to many objections on mechanical grounds. The employment of a direct corrective force applied to the displaced fragments by means of the thenar eminences of the hands of the surgeon is a far more logical and effective procedure. This method, introduced long ago by H. O. Thomas, of Liverpool, has been taught repeatedly by Sir Robert Jones, and is now practised widely. With the lower fourth of the radius controlled directly by the surgeon in this way, disimpaction may be achieved and the lower fragment brought forwards, the rotation and radial deviation being corrected at the same time. The outstanding sign of a perfect reposition is the restoration of the anterior concavity of the radius in the fractured area. Also, the normal relation of the styloid processes should be capable of demonstration. The accuracy of the correction is best appreciated when the wrist is fully flexed.

(*b*) *Retentive Splinting.*—Where a definite impaction with displacement has been reduced there is always a tendency to redisplacement, and accurate splinting is thus necessary to prevent a recurrence of the deformity. Many "special" splints have been devised for the treatment of Colles's fracture, but most of them are suitable for cases where no displacement exists, and where splinting is really unnecessary. The most efficient and comfortable control of a reduced Colles's fracture is attained by the use of two ordinary gutter-shaped fracture splints made of light sheet iron or aluminium, the latter possessing the advantage of being permeable to the Rontgen rays. Two corrective gauze pads are first placed in position, one on the extensor aspect exerting a forward thrust on the lower fragment, the other at a higher level on the flexor aspect of the forearm to control the upper fragment. The application of the splints holds the pads in place, and the fracture is now secure. The posterior splint extends from the outer condyle of the humerus to just behind the metacarpo-phalangeal joints; the anterior splint from the elbow to the base of the thenar eminence. A turn of adhesive strapping above and below ensures fixation, but the addition of a bandage is a wise precaution. Following the practice of the Liverpool School, the splints should be twisted spirally but in opposite directions before their application. By this means the forearm is supported in four planes instead of two, and sagging of the ulna prevented. The splinted limb is now suspended in a sling with the elbow at right angles.

(*c*) *After-treatment.*—The fingers being left free, the patient carries out active movements of all digits from the first. If œdema is marked, very light massage may be instituted, but must be limited to the area exposed. It is usually unnecessary to take off and readjust the splints before the fourth day, and often they may be left until the end of the first week. From this time onwards one splint may be removed daily and the lightest massage applied to a much greater area provided (*a*) the fracture shows no tendency to redisplacement, and (*b*) the services of a masseuse specially trained in the treatment of recent injuries in a large fracture clinic are available. During such treatment the position of the fragments must be absolutely controlled, and at the conclusion of each sitting the pads and splints replaced accurately. By the end of the second week gentle *active* movements of the wrist may be attempted, the fracture meanwhile being controlled between the thenar eminences of the masseuse. In addition, a short range of pronation and supination should be essayed. Any increase in pain, tenderness, or local swelling after such movements is an indication that the masseuse is going ahead too rapidly. The splints are retained on the average until the end of the third week, when the fracture should begin to feel firm. At this stage it is a wise precaution to keep on one splint or two smaller light splints merely as a guarding apparatus, for it must be remembered that the callus is easily strained. The range of movement at the wrist and radio-ulnar joints should be increased by gradual degrees. Active movements, which are now carried out with little or no discomfort, should be supplemented by gentle assisted movements. It may be emphasised here that the traditional *passive* movements have no place in the treatment appropriate to this stage. By the sixth week there should be an absence of any œdema of the hand or forearm, the fingers should be mobile, and the wrist capable of taking a fair degree of strain without reaction. The sole remaining disability will probably be a slight limitation of supination, usually remedied by passive stretching by the masseuse. Finally in the gymnasium the wrist is tested by special exercises. The cosmetic result obtained varies considerably, but in many cases where the symmetry of the wrist is not restored perfect function may be seen.

Recent Impacted Cases without Obvious Deformity.

In these cases a radiogram may often reveal the existence of slight rotation of the lower fragment, and it is not uncommon to notice at a later stage that the radius is definitely shortened and the lower end of the ulna unduly prominent. In the presence of such anatomical defects, full functional capacity may be restored by the *immediate* institution of the physio-therapeutic measures already detailed. Although splinting is unnecessary to maintain correction, it adds to the comfort of the patient if light aluminium splints are worn for the first week. On the advisability of correcting barely appreciable displacement opinions are divided, but it is generally agreed that in elderly people no attempt should be made to disimpact, nor in cases seen a week or more after the accident.

Treatment of Neglected Cases.

Where there is gross deformity or actual malunion accompanied by disabling sequelæ, operative correction is indicated, but not necessarily open exploration. Up to two weeks from the time of the injury it may be corrected by manipulation alone, or by means of the Thomas wrench. After the third week an open operation will be advisable, and should consist in merely cutting through the line of union and replacing the lower fragment without employing internal fixation. In elderly patients it is rarely wise to undertake operative measures, and an attempt should be made to restore function by physio-therapeutic treatment, the deformity being ignored.

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Special Articles.

THE SHORTAGE OF NURSES: SOME PROPOSALS FROM AMERICA.

THE shortage of suitable candidates for the nursing profession is not confined to this country. It is keenly felt in the United States, and a study of an exhaustive investigation of the reasons for this shortage in America shows that, though the conditions of training and subsequent responsibilities of nurses are not identical in the two countries, the problems to be faced are closely allied.

The Rockefeller Inquiry.

We set forth below the results of an inquiry by a committee originally appointed by the Rockefeller Foundation in January, 1919, to study the proper training of public health nurses.

There are at present two distinct types of public health nursing practice in the United States—that in which the nurse confines herself to the teaching of hygiene, and that in which such didactic work is combined with the actual care of the sick. A third type of visiting nursing, in which bedside care is given with no official educational service, as in our own district nurse systems, may be observed but is less common. The advantages of the second type, of combined instruction and care, are well set out in the report and should receive the attention of the district nursing associations and of local authorities in this country. The nurse who approaches a family where sickness exists and renders direct technical service in mitigating the burden of that sickness has an overwhelming advantage, then and thereafter, in teaching the lessons of hygiene. It is noted in the report of the committee that the relative lack of nursing personnel in Europe has there led to the attempt to train health visitors of the purely instructive type for dealing with special individual problems, such as tuberculosis or child welfare, by training courses much shorter than those required for the preparation of the nurse, but it is maintained that, at any rate for conditions as they exist in the United States, the teacher of hygiene in the home should be equipped with no less rigorous training than that accorded to the bedside nurse, further supplemented by special studies along the lines of public health and social service. Since this view is generally accepted in America, it soon became clear to all concerned that the entire problem of nursing and of nursing education, relating to the care of the sick as well as to the prevention of disease, formed one essential whole, and in February, 1920, the Foundation requested the committee to broaden the scope of their inquiry to include "a study of general nursing education, with a view to developing a programme for further study and for recommendation of further procedure."

The outcome of this inquiry has now been issued in book form.[1] It is the provision of sufficient competent nurses for the sick and the need of attracting good probationers to the nursing school that are problems of even more urgent importance in this country than the provision of public health nurses, and it is to the section of the report dealing with these that we propose to direct attention. There, as here, there is much discussion as to the quantitative and qualitative adequacy of the nursing service. As to the first point, according to the committee the reason why many persons who need nursing care in hospitals and in the homes of the poor fail to receive it is to be sought in economic factors rather than in a shortage of nurses. In regard to the quality of the nursing service available at the present day more radical differences of opinion are to be found. Private physicians frequently express the view that for ordinary nursing even the graduate of the existing training school is "over-trained," that the service which she renders is too costly, and that a woman with a very brief training in bedside routine would be as satisfactory, or perhaps more satisfactory, than the average registered nurse. As a result of this feeling there have been persistent and vigorous efforts in certain quarters to break down the standards of nursing education which have been laboriously built up during the past 20 years.

Two Grades of Nurses.

In so far as these efforts would remove the safeguards which guarantee to the patient suffering from acute disease, and to the physician caring for such a patient, the quality of service necessary for safety, it is felt that they constitute a real danger to the cause of public health. But having made this point, the committee proceed to give careful consideration to the question whether there is not scope for two grades of nurses, and conclude that for the care of mild and chronic illness and convalescence it may well be that a different type of capacity and training may be necessary. It seems clear to the committee, however, that, if two types of nursing service are desirable, the distinction should be drawn, not on economic grounds, but according to the type of illness involved. Careful estimates from 118 graduate nurses indicated that during a period of three months one-quarter of their time was spent on cases which could have been cared for by an attendant of the partially trained type. A somewhat similar estimate was obtained from 48 practising physicians, 21 believing that trained nurses were unnecessarily employed for less than a quarter of their cases, 17 placing the figure between one-half and three-quarters, and 10 at over three-quarters.

A subsidiary nursing service would be no new development. The "practical nurse," alias the "trained attendant," is an existing fact: and in the opinion of a large group of the medical profession who utilise her services she fills a real place in the complex problem of caring for the sick. On the other hand, the danger in the existence of a loosely-defined and unregulated group of partially trained workers, in the same field as a more highly educated type, constitutes a real and serious complication. The nursing profession has discharged a fundamental duty to the public in stimulating the development of registration laws, which define and delimit the practice of that profession, and protect the community against fraud and exploitation by those who assume responsibilities to which their qualifications do not entitle them. In addition to the registration of the trained nurse it is considered essential that the lower grade of nursing service should also be defined and registered, and the States of New York, Missouri, California, Michigan, and Maryland have taken definite steps in enacting legislation towards this end.

The Name for the Subsidiary Group.

The name to be selected for the subsidiary group is a difficult problem. As is so often the case, the root of disagreement lies largely in nomenclature. The title "attendant" is distasteful to those who bear it and tends to discourage the enlistment of those who may desire to enter this field. On the other hand, the term "practical nurse" assumes a most unfortunate antithesis between education and practice, and the splendid professional and public service rendered by "the nurse" in war and in peace, entitles her to the protection of her existing professional status. The term "nursing aide" or "nursing attendant" is suggested as that which best meets the need for clear differentiation, while providing the subsidiary worker with a suitable name. With two distinct grades of service available, the individual physician would be responsible for the choice of a trained nurse or a nursing attendant in a given instance. The subsidiary type of worker would serve under practising physicians in the care of mild and

[1] Nursing and Nursing Education in the United States (Report of the Committee for the Study of Nursing Education). New York: The Macmillan Company. 1923. 15*s*.

chronic illness and convalescence, and possibly assist under the direction of the trained nurse in certain phases of hospital and visiting nursing.

The Hospital Training School.

The development of the hospital training school for nurses constitutes a unique chapter in the history of education. In almost all fields of professional life education has begun on a basis of apprentice training. The first law schools and the first medical schools were the outgrowth of the lawyer's and the physician's office. In nearly all other fields than that of nursing, education has outgrown the apprentice stage and leadership has passed into the hands of independent institutions, organised and endowed for a specifically educational purpose. The training of nurses, on the other hand, is still in the main directed by organisations created and maintained for the care of disease rather than for professional education. The progress which has been accomplished under such anomalous conditions is such as to reflect high credit upon both hospital administrators and the leaders of the nursing profession. Yet the conflict of interests between a policy of hospital administration, which properly aims to care for the sick at a minimum cost, and a policy of nursing education which with equal propriety aims to concentrate a maximum of effective training into a minimum time, is a real and vital one. The fact that the nursing profession fails to attract students in the number, and of the quality desired, strongly suggests that there is some shortcoming in the established avenues of approach thereto. The hospitals themselves, depending as they do so largely upon student nurses for their routine operation, have found themselves seriously handicapped by the small number of well-educated applicants. Inspection of 23 training schools representative of the best current practice in nursing education revealed some interesting points. For example, in some cases theoretic instruction was at fault; in others, ward duties appeared to be largely dictated by the need for hospital service rather than by the educational requirements of the students. This was evidenced by the astonishing irregularity of the time spent on different services by individual students and by the marked deviation between the duties actually performed and those scheduled in the official programme of the course.

The supervision of work in the wards was in certain instances notably inadequate. In only a few brilliantly exceptional cases was the ward work purposefully correlated with theoretical instruction. The lack of an intelligently planned progressive training was obvious in a large number of the hospitals studied, first year students often being found in positions of responsibility for which they were wholly unprepared, while seniors in another ward were repeating an educationally idle and profitless routine. Most striking of all was the factor of time wasted in procedures essential to the conduct of the hospital but of no educational value to the student concerned. Hours and days spent in performing the work of a ward maid, in putting away linen, in sterilising apparatus, in mending rubber gloves, in running errands, long after any important technique involved had become second nature, accounted in one typical hospital operating under the eight-hour system, where this problem was specially studied, for a clear wastage of between one-fourth and one-fifth of the student's working day.

The total amount of time assigned to ward service under the conditions which obtain in many hospitals is, in itself, a fairly complete obstacle to educational achievement. The selected group of hospitals, in this respect above the general average, showed a median day of between 8 and 8·5 hours on ward duty alone, exclusive of all classroom instruction. Irregular, excessive, and unproductive night duty was the rule rather than the exception. Crowded and unattractive living conditions tend, in certain hospitals, to impair the morale of the student body, and an atmosphere of autocratic discipline frequently prevents the development of a psychological atmosphere favourable to effective coöperative effort. It is emphasised that such shortcomings as have been pointed out are not fairly chargeable to deliberate neglect on the hospital authorities or nursing superintendents. In so far as they exist, they are due to the inherent difficulty of adjusting the conflicting claims of hospital management and nursing education, under a system in which nursing education is provided with no independent financial endowments for its specific ends.

Suggested Improvements.

The difficulties, however, are not insuperable. Each of them has been overcome in some schools and most of them in certain of the best schools. But that does not affect the view of the committee that one of the chief reasons for the lack of sufficient recruits of a high type lies in the fact that the average hospital training school does not offer a sufficiently attractive avenue of entrance to the nursing profession. Their recommendations for the improvement of the hospital training school include a raised standard of educational attainments for student nurses; a preliminary term of four months' training in the basic sciences and in elementary nursing procedures with appropriate ward practice but without regular ward service; and a period of 24 months (including two months for vacation) devoted to a carefully graded and progressive course in the theory and practice of nursing, with lectures and ward practice so correlated as to facilitate intelligent case study, and with the elimination of routine duties of no educational value. The working day for the student nurse, including ward work and classroom periods, should not exceed eight hours. The working week should not exceed 48 hours and preferably 44 hours. By such an organisation of the course of study, and particularly by the elimination of unrewarding routine service, it is held that the period of training might be safely shortened from the present standard of three years to 28 months. Such a saving would mean an increase of over 20 per cent. in the potential output of the training school through the saving of time alone. The shortening of the course would, in itself, prove an attraction to the prospective student, but the main consideration to be kept in view is that the shorter course projected would not imply a lowering but a raising of educational standards. It is the experience in every other field of education that the way to attract students is to raise standards, not to lower them. The fundamental essentials to the success of a training school planned on these lines are that it must be directed by a board organised for the primary purposes of education. The interests of hospital management and of educational policy must necessarily at times conflict, and unless the educational viewpoint is completely represented the training school will infallibly suffer in the end. In the second place it is fundamental to the success of nursing education that adequate funds should be available for the educational expenses of the school itself, and for the replacement of student nurses by graduate nurses and hospital helps in the execution of routine duties of a non-educational character. A satisfactory relationship between school and hospital demands careful cost-accounting and a clear analysis of the money value of services rendered by the school to the pupil and the hospital, and by the hospital to the pupil and the school.

The course of 28 months discussed above would furnish the complete education for a student desiring to practise as a bedside nurse in private duty or in hospitals and other institutions, and its completion should entitle her to a diploma in nursing and to State registration. For the nurse who desires to specialise along either of the more advanced lines of public health nursing, or hospital supervision and nursing education, a further period of post-graduate training is desirable.

Educational Provision for the Subsidiary Type of Nursing Service.

In the view of the committee there is a real place for a subsidiary type of nursing service, to be

used in the institution and in the home for the routine care of patients suffering from disease of a mild or chronic type or in convalescence. It is pointed out that, whether approved of or not, this subsidiary nursing service is an existing fact, and that women whose only training is, say, a course in home nursing of a few weeks' duration, such as those conducted under the auspices of the American Red Cross, are actually engaged in nursing chronic cases throughout the country. Since the existence of the subsidiary nursing group is a concrete fact, and in view of the valuable results to be derived from the service of this group in a definitely restricted field, it is considered that specific provision should be made for the training of workers of this type.

The special hospital not served by affiliation with a school of nursing, and the small general hospital whose facilities are inadequate for the maintenance of a nursing school of standard grade might be considered as training grounds. The requirement for entrance should be a grammar-school course or its equivalent and the period of training approximately eight or nine months. It is essential in providing for this type of education that hospital patients should be protected from malpractice and students from exploitation by an adequate graduate nursing service for the care of acute illness and for supervision of the students. Again, therefore, reasonable financial support must be assured before this, or any other, educational enterprise can be honestly undertaken. It is further believed that a useful development in the training of nursing aides can be expected only when the standards of the schools for such aides and their activities after graduation are controlled by a properly safeguarded system of State legislation, such as now exists in Missouri. The Missouri Act is unusually effective in providing that "no person shall practise as a nurse for hire or engage in the care of the sick as an attendant for hire unless licensed by the Board."

The Financial Problem.

It is held that the educational plan outlined above is sufficient for the solution of the problems involved in securing an adequate nursing service of all essential types. The school for nursing aides would provide the subsidiary worker needed for the care of the mild and chronic and convalescent case. The hospital training school, with adequate funds and an independent educational organisation, would attract more candidates and better candidates and would prepare them adequately for the nursing of acute disease. The university school of nursing would prepare the leaders in public health nursing, in hospital supervision, and nursing education and would inspire and standardise the entire movement. It is clear that the attainment of these ends requires financial support. It is time, in the view of the committee, that the hospital should be relieved from the dilemma of exploiting student nurses on the one hand, or of diverting funds given for the care of the sick on the other, by the provision of endowment specifically devoted to the purposes of education.

NATIONAL MILK CONFERENCE.

DISCUSSION ON PASTEURISATION.

ABOUT a year ago a conference on the milk problem was held at the Guildhall, London, convened by the National Clean Milk Society, and supported by a large number of societies interested in the public health, in agriculture, and in the dairying trade. On Nov. 21st, 1923, a second conference was held at the Guildhall under the same auspices and attended by many representatives of local sanitary authorities and the trades concerned, including representatives from the overseas dominions and foreign countries. The object of this second conference, as Mr. Wilfred Buckley, who presided at the morning session in the unavoidable absence of Lord Astor, explained, was to throw light on all matters connected with pasteurisation.

Trade Aspects.

Six papers were read and discussed, and of these three were concerned mainly with the trade side of the question. Dr. Richard Seligman dealt with the history of methods and apparatus, and explained the difficulty of ensuring that every particle of milk passed through an apparatus had been kept at the desired temperature for the desired period of time. He expressed the opinion that this result was as yet satisfactorily obtained by only one type of "positive holder" machine, but that the last word had not been said. He appealed to scientific men to help in perfecting methods, seeing that pasteurisation is, at the moment, absolutely necessary for the liquid milk trade. Mr. J. H. Maggs (United Dairies, Ltd.) considered the financial and commercial aspects of the question, and Mr. A. T. R. Mattick, B.Sc. (Reading Institute), dealt with the alterations of the cream line and cream layer caused by the various temperatures used for pasteurising. This is also a trade question. As long as the fat is in the milk, it does not matter from a public health or nutritional point of view how much of it comes to the top. To many people one of the attractions of homogenised sterilised milk in bottles is that the cream will not separate. However, the public naturally judge the richness of the milk from the thickness of the cream layer, and it was satisfactory to learn from Mr. Mattick that if the milk is held for 30 minutes at a temperature not exceeding 145° F., there is not likely to be much alteration in this layer. The other three papers dealt with the chemical, bacteriological, and so-called biochemical changes.

Chemical Changes in Pasteurised Milk.

Prof. G. B. Schryver (Imperial College of Science and Technology) introduced the subject of chemical changes. His paper did not suggest that any appreciable change was likely to occur as the result of a temperature of 145° to 150° F. for 30 minutes. He referred to the question of the alteration of the calcium and phosphate content of milk by heat and the possible precipitation of some of the calcium phosphate. He also mentioned the work of Daniels and Loughlin at Iowa University in 1920 on this subject, but, as these observers used boiling temperatures, their results had no bearing on the present instance. Mr. G. W. Monier Williams, Ph.D., following Prof. Schryver, said that as far as we knew chemical changes up to 145° F. were very slight. Lactalbumin was not coagulated, the action of rennet on milk was unaffected, and the calcium phosphate was not separated from the casein. Pasteurisation diminished the acidity and raised the freezing-point, but these results might be due to the driving off of the carbonic acid contained in fresh milk. Capt. Goulding (Reading Institute) thought we could not speak with certainty as to the meaning of the apparently small changes which took place at 145° F.

Bacteriological Changes.

Prof. J. M. Beattie (Liverpool) read a paper on the bacteriology of pasteurised milk. He submitted the results of examining samples of pasteurised milk in all parts of the country, which indicated that pasteurisation as at present carried out was anything but satisfactory. Prof. Beattie went on to quote the very conflicting results obtained by various observers as to the thermal death-point of the tubercle bacillus in milk, and expressed his doubt as to whether 30 minutes at 145° F. would render milk safe in this respect. Capt. S. R. Douglas (Medical Research Council) and Dr. R. Stenhouse Williams (Reading Institute) expressed the same doubt. Dr. Thomas Orr (Ealing) spoke in favour of the "positive holder" apparatus and considered that milk held at 145° F. for 30 minutes was good commercially and safe for the consumer. He quoted the results of Dr. F. W. Campbell Brown, of

Aberdeen,[1] which showed that 30 minutes at 145° F. or 5 minutes at 163° F. would kill the tubercle bacillus in milk. Dr. Stenhouse Williams emphasised the need for the education of the workers, whether in the cowshed or in the milk dealer's premises. Good apparatus alone was not sufficient; it must be handled by people with knowledge.

Biochemical Changes.

Prof. F. Gowland Hopkins (Cambridge) dealt with enzymes, immunising bodies, and vitamins. Some of the enzymes appeared to be of bacterial origin. They seemed to be rather accidental than essential constituents of milk. Their action was slight, we did not know that they were of any use nutritionally, and their destruction in pasteurisation appeared to be unimportant. The immunising bodies were of no use to the human species, though their presence in milk was one more argument for breast-feeding. The three or four vitamins were all present in milk, nicely balanced, and in quantity leaving little margin of safety. Only vitamin C was likely to suffer from heating processes and could easily be compensated for. He did not favour pasteurisation, as even if there was no proved biochemical harm, his work gave him a bias in favour of altering foods as little as possible. Dr. Harriette Chick (Lister Institute), following Prof. Hopkins, referred to a New York outbreak of scurvy as a result of the temporary abandonment of orange-juice among babies fed on pasteurised milk, and which was ended by the resumption of the orange juice. She emphasised the danger of repeated pasteurisations, instancing her experience in Vienna. Dr. S. S. Zilva (Lister Institute) mentioned that vitamin C was less easily destroyed by heat than was at one time thought, if alkalinity and oxidation were provided against.

In the concluding general discussion Dr. Eric Pritchard, summing up, thought that the views expressed indicated that the changes caused in milk by pasteurisation, as defined by the new regulations, were unimportant, and this was entirely in accord with his own experience.

Advance or Makeshift?

Dr. W. G. Savage (Somerset) said pasteurisation was a short cut in public health and a confession of failure. He hoped the recent agitation for cleaner milk would not be discouraged. The trade was up against the dilemma, "what is safe is not nice and what is nice is not safe." None of these apparatus was fool-proof. There were three cardinal points if pasteurisation were adopted as a temporary expedient. These were: (1) Efficient control, (2) a guarantee against repeated pasteurisation, (3) no hindrance to progress in obtaining better milk. Prof. H. R. Kenwood (Stoke Newington) said more knowledge was needed. Conflicting views were partly due to the loose use of the term "pasteurisation." He thought Prof. Beattie's results had been unsatisfactory because the milk had not been treated in the most up-to-date "holder" machines. He favoured the idea of a team of experts, appointed in coöperation with the trade, for the purpose of endeavouring to settle the points on which opinions were at variance. This suggestion was strongly supported by Lord Dawson, who took the chair during the afternoon session.

On the whole, the impression the conference left in our minds was that no appreciable advance in knowledge could be recorded since the Guildhall meeting a year ago. A third conference on the milk question was convened by the Society of Arts on April 25th last and was presided over by Mr. F. B. Acland. It is probably too soon to expect any information as to how the new regulations for pasteurisation are working, but we may venture to hope that before another milk conference is convened, the team of experts suggested by Prof. Kenwood will have something to report.

[1] THE LANCET, August 18th, 1923, p. 317.

MEDICINE AND THE LAW.

Criminal Acts and Mental Deficiency.

Two cases recently tried at the Central Criminal Court appear to have had some common features but different results, which should be of interest to those who desire to see the mental condition of persons committing criminal acts carefully weighed in estimating the treatment, punitive or otherwise, to be meted out to them. Cuthbert Rice, 26 years of age, the son of a clergyman, was charged with unlawfully attempting to forge a public document, the *London Gazette* of April 4th, 1923, with intent to deceive. Having served in the army he had afterwards gone to Cambridge and had been convicted at Quarter Sessions and sent to prison for stealing from the rooms of undergraduates. He then seems to have conceived the idea that he could reinstate himself in the eyes of his relatives and friends by getting printed, in a spurious page, purporting to be from the *Gazette*, statements with regard to military honours and awards accorded to him. This obviously would be a course which could hardly escape detection. Dr. Henry Head gave evidence that Price was not certifiably insane, but that he was, in his opinion, a person of "feeble will and doubting purpose liable to fits of depression," who could best be dealt with under medical care in such an institution as Camberwell House. Dr. W. N. East, medical officer of Brixton Prison, concurred in these views, and Judge Atherley Jones, who accepted them, bound the accused over to come up for judgment if called upon, with the object that he might be treated at Camberwell House. In doing so Judge Atherley Jones said that the law only enabled the court to order the detention of persons as mentally defective who had shown such deficiency from birth, or at an early age.

In another court the Recorder had before him recently the case of Doreen Taylor, 20 years of age, said to have been a domestic servant, who had committed perjury in connexion with the arrest of two young men, having witnessed the occurrence in the street. Her evidence, which involved grave charges against the police, was designed to secure their release, and was clearly of a nature to cause investigation. She had also described herself as a waitress, giving her alleged address, and the untruth proved easy to bring home to her. Dr. J. H. Morton, of Holloway Prison, said that she had threatened to commit suicide, and was in his opinion mentally deficient but not certifiable. She had committed thefts of suit cases and other articles, of which she was also convicted. Sir Ernest Wild, in sentencing her to imprisonment amounting to nine months with hard labour, told Taylor that her career had been deplorable and that the only thing to teach her was "a hard, sharp sentence."

There appears to be some inconsistency between the treatment accorded to Rice and the "hard, sharp sentence" which is to teach Taylor to do better, whatever the differences may be in their mental condition and other circumstances. No doubt the former had relatives who could take charge of him, and the latter had not, but that hardly seems to relieve the State from a duty to provide in such cases as hers something more likely to prove beneficial than prison and hard labour.

An Indecent Exhibition Closed.

Sir Chartres Biron commented in scathing terms upon the conduct of Laurent Wynant, a Belgian, and Victor Luxemburg, a Pole by birth and a British subject by naturalisation, summoned recently at Bow-street police-court for being concerned in exposing in Charing Cross-road an indecent exhibition consisting of wax models of human bodies and of parts of them, and anatomical specimens preserved in alcohol. Sir Chartres Biron expressed himself as having been doubtful on two points only: whether he should order certain exhibits to be destroyed, and whether, having regard to the employment of a girl, 15 years of age, to sell catalogues inside the exhibition, he ought not to send both defendants to prison. Wynant had

informed the authorities of the kind of exhibition he was opening, which might tend to indicate his good faith; Luxemburg, who had been said by his counsel to be a member of the London Chamber of Commerce as well as a person proud of his new nationality, had shown his commercial instinct by letting the premises, of which he was the landlord, to Wynant, the owner of the exhibition, for a rental of £50 a month, or 28 per cent. of the takings, whichever was the greater, with a stipulation that he was to have immediate possession if the police interfered. "Such," said the magistrate, "is the business instinct of this patriotic Britisher, and in those circumstances I have not the slightest hesitation in convicting him as a rogue and a vagabond." The summons for an order to destroy the exhibits was adjourned sine die on the understanding that they would be taken out of the country, and both defendants were fined the full penalty of £25, and ordered to pay £10 10s. costs.

A case closely parallel occurred in London in 1903,[1] when Desirée Spitzner and Leon Dekaesmaker had their case adjourned at the Central Criminal Court to give them an opportunity to remove out of the country the contents of "Madame Spitzner's Great Museum," which, like the one referred to above, cloaked under an exhibition of anatomical models in wax what THE LANCET described as "a catch-penny appeal to the prurient." Chief Justice Cockburn, in 1868, gave a definition of "obscenity" which still holds good, when he said, "The test of obscenity is this—whether the tendency of the matter charged as obscenity is to deprave and corrupt those whose minds are open to such immoral influences and into whose hands a publication of this kind may fall."

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Dissolution of the Dublin Board of Guardians.

THE Ministry of Local Government, after a protracted inquiry by one of their inspectors into the working of the Dublin board of guardians, recommended the replacement of the board by a paid commissioner. In the letter from the Ministry to the board announcing this decision, the Minister notes that although the board consisted of 72 members, its work was mainly carried out by some 25, and the sporadic attendance of the negligent members nullified the efforts of those who were devoted to their duties. The inspector, in his report, commented adversely on the condition of the dispensaries belonging to the board. They were both dirty and cold. In one instance the inspector had failed to find either doctor or porter on the premises during dispensary hours. In all cases the inspector found measure glasses in a dirty state. Medicine seemed to be thrown about in an untidy manner; in many cases poison presses were not locked. There was also neglect in dealing with boarded-out children, and with children at nurse under the Children Act. Evidence showed that an actual system of child-farming had been indulged in. A case where six babies died in two weeks painfully illustrated this. The unregistered nursing home was an equally grave danger. There would appear to be serious need of legislation under which nursing homes, private or otherwise, would be compelled to register before accepting the care of any child. In the administration of the workhouse and its hospitals neither the master, the matron, nor the doctors could exercise an adequate control. The doctors were powerless to enforce discipline, and complaints received such scant attention that it was only in very exceptional circumstances that the board was troubled with them. The guardians had not exercised proper management in connexion with hospitals, dispensaries, outdoor relief (particularly in rural areas), stores, staffs, appointments, discipline, admissions, and discharges. The inspector sums up his views on the work of the guardians in saying that the affairs of the union were not managed, but merely transacted.

In dealing so drastically with the board of guardians under its jurisdiction the Ministry probably intends its action to stand as a serious warning that negligence or inefficiency by boards of guardians will no longer be tolerated.

Vaccination in Ireland.

The Free State Government is wisely alive to the danger of importing small-pox from England, and is taking steps to safeguard the health of the country. In answer to a question in the Dail last week, the Minister for Local Government stated that, owing to prevalence of disease in England, medical officers of the ports had been warned, whilst the vaccination authorities in the Saorstat had been advised of the danger. In one or two districts the number of defaulters was high, but the matter was being carefully watched. If the local authorities failed to take adequate measures to ensure the safety of the public, steps would be taken to compel them to do so.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Unsettled Conditions in the Medical Profession.

AT present the members of the medical profession are suffering from the effects of serious unrest caused by internal and external factors. As has been mentioned in a previous letter (THE LANCET, June 23rd), a serious split occurred in the "Economic Organisation of Doctors." The hospital medical staffs endeavoured to construct an organised corporation of their own, the aims of which would not infrequently have clashed with the aims of the older corporation. At the present time, when combination of forces and uniform action are essential, such disruption is bound to spell ruin for both parties. Partly under the influence of this reflection, partly from purely economic considerations, numerous hospital doctors have returned to the mother organisation, and there is reason to expect in due season a re-union of the two sections. Another source of disquiet has arisen in the profession through a decision of the Government to extend the scope of the compulsory insurance against illness. All persons receiving salaries or wages are to be entitled to free medical help, without any restrictions as to the absolute amount of their income, the insurance to cover also their families if they pay the premium for them. The profession hitherto has not been asked to give its opinion on this scheme. But although "free choice of doctor"—an old demand of the profession—has been granted, this is only regarded as a slight concession to medical feeling. The Government will have to come to terms with the representatives of the practitioners, otherwise the Bill might become law—but the doctors will not coöperate. Nevertheless, earnest attempts at negotiation will be made by the leaders, as the opportunities for private practice will be cut down almost to nil, if, for example, a manager of a bank, a director of a business concern, or the family of a stock exchange broker may call in an "insurance" doctor.

In the course of preparing the lists of voters for the election of the Medical Council, a survey of all practitioners in this country was ordered by the Board of Health. This was necessary, as since the disruption of the former empire numerous medical men have settled down in Vienna and elsewhere, who are not citizens of the Republic. The number of defaulters was very small, however. The new council will be elected under the New Medical Act, which gives much more discretionary power to this body, and endows it with disciplinary jurisdiction over the doctors in a large number of more or less serious offences against medical ethics. In the face of the progressing pauperisation of the profession one cannot wonder that illness and old age are objects of

[1] See THE LANCET, Jan. 24th, 1903, p. 275, and March 21st, 1903, p. 816.

real terror for the doctor of to-day. Strenuous efforts to obtain insurances against these contingencies on the part of the organisation have hitherto been fruitless. The Central Medical Council nominated a special committee last year to study the problem, and since its suggestions were not practicable, private enterprise has set to work to construct an adequate scheme. The latest proposal deals not only with insurance against illness and old age, but also with insurance for widows and orphans of practitioners. Further, it demands that membership of this medical union be made compulsory by law. The difficulties of the variations and fluctuations of our exchange rate might be overcome by calculating—and paying—fees in a stable exchange rate, preferably on the gold system. Experts are now studying this scheme, which entails the payment of about a pound sterling monthly from each doctor. This expenditure seems, however, to be very heavy for the average income of an Austrian doctor. At all events, the problem is an acute one, and some solution must be found if serious disaster is to be avoided.

Appointment of a New Director of the Chemical Institute.

The Ministry of Education has recently appointed Prof. Fr. Faltis, former head of the Chemical Institute in Graz, to the vacant directorship of the Pharmaceutical Chemical Institute of the Vienna University. Prof. Faltis is a graduate of Vienna, and before he was called to Graz was for some years at the head of the School of Apothecaries in Vienna. Whilst working there he published some important contributions on the chemistry of alkaloids. His new position will enable him to emphasise to students of medicine the importance of studying the physiological effects of modern pharmacology.

Scarcity of Cadavers for Anatomical Studies.

The Vienna Anatomical Institute is faced with a serious difficulty as the students cannot be given the human material required to obtain a fundamental knowledge of anatomy. In 1921–22, the Institute received 78 whole bodies and 79 dissected cadavers of infants. In 1922–23, the supply had dropped to a total of 31 bodies, whilst this year only one single corpse has been available, and there are over 1000 students who expect to do dissecting work at the Institute. Two years ago the scarcity was very marked, as no more than two corpses could be handed over to a dissecting group of six men per half-year term, against four or five corpses 10 to 15 years ago. At present not even one body is available for such a group, and when the last one of the bodies preserved in the cellars of the Institute has been dissected, the directors will be obliged either to close the Institute entirely or to cut down the work drastically. The reason for this scarcity can be explained only in part by the diminution of the number of patients in the hospitals owing to the reduced size of the State. The chief reason is the formation of a society which undertakes the burial of unclaimed bodies in the hospital mortuaries. Formerly, the corpses were handed over to the anatomical theatres and then buried after dissection. In vain the dean of the faculty and the heads of the anatomical institutes have pressed the matter with the Ministry of Education. There are very high ecclesiastic influences directed against the dissection of human bodies. Such influences are stronger than one would expect and counteract all endeavours by the faculty to adjust matters. At present negotiations between the dissecting departments of hospitals and the anatomical institutes are on foot to arrange an exchange of material, but this is at best only a temporary adjustment of a condition which must be cleared up by legislation, if Vienna is to retain her position in the medical world.

Marked Decrease in Venereal Disease.

A report of the Board of Health dealing with the effect of prophylactic measures states that the morbidity from venereal disease, especially gonorrhœa, is rapidly diminishing in Vienna. Striking figures are given by the out-patient departments of hospitals, and from the dispensaries instituted by the Krankenkassen (sickness insurance clubs) of the workmen. Whilst in 1918 more than 30 per cent. of the patients of the dermatological departments both of hospitals and clubs complained of sexual diseases, in the first half of 1923 the percentage went down to 5 and under, the total number of patients remaining about the same. This means, in other words, a decrease of over 80 per cent. in the incidence of venereal disease. Also in private practice we find similar conditions. Whilst three to five years ago the waiting-rooms of venereal specialists were thronged with members of our "best" society, now no more than 5 per cent. of better-class patients suffer from lues or gonorrhœa, a fact which is clearly reflected in the precarious financial position of many dermatologists of repute. The chief credit of this welcome improvement in public health is due to the efforts of Prof. Finger and Prof. Tandler. To combat the former alarming spread of venereal disease Prof. Finger suggested the institution of a large number of free dispensaries on the one hand and public instruction on the other. Prof. Tandler, during his tenure of office as Minister of Health, carried out these proposals, and with much energy organised in every Vienna district, as well as in every large municipality or industrial centre, an "ambulatorium" (dispensary) where qualified specialists gave free medical help to all persons applying for treatment. No questions were asked, no fee required, and the hours of attendance were after working hours (5–8), so that no loss of valuable time was entailed by the patient—a point of consideration often neglected in hospitals. The leading idea was prophylaxis against disease, and immediate treatment in case of disease. By widespread public enlightenment—lantern lectures, instructive leaflets, teaching of pupils in higher schools—the public have learned to regard venereal disease not as a thing to be ashamed of, but as a condition requiring proper treatment, just as any other infection. The 21 evening dispensaries in Vienna have now, by their own work, rendered themselves almost superfluous. Seven have been closed, and it is hoped that shortly the ordinary institutes—viz., clinics and hospital departments—will be sufficient to deal with the existing cases.

BUCHAREST.

(FROM OUR OWN CORRESPONDENT.)

Pre-Matriculation Examinations in the Universities.

THE Minister of Public Instruction, Mr. Anghelesen, has instituted a new measure in the universities of Roumania. The universities must now themselves examine students before allowing them to matriculate. This regulation has caused much dissatisfaction among the students who passed their school-leaving examinations only a few months ago. As yet the university examining board has not been too severe, judging from the fact that, for instance, in Cluj only a few out of 90 applicants were rejected. The board lays the chief stress on the general knowledge and intelligence of the students. The subjects of examination are: Roumanian language and literature, history, geography, and constitution; in the medical faculty anatomy and physiology are added. It is a general principle that only such students are matriculated as are able to understand the lectures in the Roumanian language. The professors, however, appreciate that almost all applicants claim Hungarian as their mother tongue, and allow them to answer in Hungarian, if they cannot express themselves in Roumanian. It is an undeniable fact, however, that this new system, which is unique in Europe, has considerably decreased the number of first-year students in the Roumanian universities. Foreign applicants with maturity certificates of foreign schools are exempt from the admission examination, lest foreign universities should reciprocate by applying the same

measure against Roumanian students. As a consequence of this new measure numerous Hungarian and Saxon students (there are very many Saxons in Transylvania) have matriculated in foreign universities. Even Roumanian students have gone to Italian and French universities to evade the admission examination. It is remarkable that in the medical faculty of the Cluj University out of 82 first-year students there are altogether only three Christian Hungarians and four Jewish Hungarians, although the majority of population in and around Cluj consists of Hungarians. This can be attributed to the frequent demonstrations against the Jewish and Hungarian students in the course of the last year, when, following serious disturbances, the university had to be closed for a whole session.

Excessive Taxation of Medical Men.

Bitter feeling has been aroused among the doctors of Roumania through excessive taxation. Under the recent law relating to the standing of professional men, lawyers and doctors have been placed in the same category as retail merchants, and a tax of 16 per cent. has been levied on all professional income. The income of the physician is fixed by a committee consisting of four representatives of the financial authorities together with one medical man. The voice of the profession is thus easily overborne, and taxes are imposed which simply spell ruin to the rank and file of the doctors. The injustice of this burden is all the greater as the basis of income on which the 16 per cent. tax is paid is calculated on the physician's total earnings during the past year, and no allowance is made for expenses such as rent, household, carriages, instruments, journals, &c., as was done in former years. The various medical associations of the country have united in a movement to demonstrate against this crushing imposition, and the Government has been threatened that, unless the taxes are reduced, all private doctors of the country will cease to give gratuitous medical service to the poor. Up to the present there has been no reduction in the income-tax, but a new tax has been devised, called the "Sign-Board Tax," by which a levy is made on every professional sign or name-plate. Doctors in the outlying districts are heavily penalised in that name-plates in any other language than Roumanian are taxed 60 or 80 fold. And considering that in Transylvania, Bukovina, and Bessarabia there are about 2500 doctors with an entirely non-Roumanian speaking clientèle, it is easily understood that this order has caused great dissatisfaction. For instance, in Arad, a flourishing industrial and commercial town in Transylvania, the tax upon a name-plate or sign bearing Hungarian words amounts to 8000 lei, which is equivalent to the doctor's total fees for more than 100 visits. Thus a young practitioner, newly settled, who puts up his plate stating his consultation hours, &c., in the language of the people on whom he is dependent for a livelihood, finds his returns for at least two months in a year swallowed up by this tax. Also he is fortunate if he is paid for 100 visits in two months. A deputation was sent to the Minister of Finance to urge that the language of the universities be not regarded as "foreign." Some optimists hope that the Minister may adhere to the statutes of the Versailles Peace Treaty, which provides for the unrestricted use of their mother tongue by all sections of the nation.

Doctors and the Telephone.

The Roumanian telephone authorities have two separate scales of charges for subscribers, 3000 and 1000 leis (nominally £120 and £40) respectively. The former charge is made to business men, lawyers, and physicians, while the latter applies to private persons. The medical faculty of Roumania has protested several times at this classification of the profession along with tradespeople, and has emphasised the benefits which accrue to the public through the doctor's telephone. All protests, however, have been in vain, and the Minister refused the appeal of a large medical deputation which requested the reduction of telephone charges. As a sequel, the medical men of Bucharest resolved to make a "telephone strike," so that on Nov. 10th no doctor responded to any call over the telephone. The general public fully appreciates the position of the doctors, and cannot understand why a physician should pay as much as a wholesale merchant or a bank, when a capitalist living on the dividends of his capital may have a telephone for a third of the sum the doctor has to pay. Although the "strike" made a deep impression on the authorities, as yet no reduction in the telephone charges has taken place.

Correspondence.

"Audi alteram partem."

CENTENARY OF THE LANCET.

To the Editor of THE LANCET.

SIR,—I have pleasure in informing you that the Council of the London and Counties Medical Protection Society, Limited, at its meeting on Nov. 21st, on the proposal of our President, Sir John Rose Bradford, seconded by our Chairman of Council, Dr. C. M. Fegen, unanimously passed the following resolution:—

"The Council of the London and Counties Medical Protection Society, Limited, heartily congratulates THE LANCET on the completion of its hundredth year, and takes this opportunity of expressing its appreciation of the high literary character of THE LANCET, and of the vigour with which it upholds the best traditions and protects the true interests of the medical profession."

I am, Sir, yours faithfully,

HUGH WOODS,
Nov. 22nd, 1923. General Secretary.

EPIDEMIC DIAPHRAGMATIC PARALYSIS.

To the Editor of THE LANCET.

SIR,—Much interest attaches to the recent outbreaks of disease in the United States, of which one is referred to in THE LANCET of Nov. 17th. Various names, including that of "devil's grip," appear to have been bestowed upon this "new disease," but that of "epidemic diaphragmatic paralysis" seems to have found most favour, on the *lucus a non lucendo* principle, since the clinical condition is recognised as one of diaphragmatic spasm. It seems pretty clear that the outbreaks form an epidemiological link between influenza of the dengue type (with a bileptic temperature curve) and epidemic hiccough, which, as is now generally recognised, "runs into" epidemic encephalitis and myelitis. As a matter of fact, in America, the new disease has already been identified with the Virginian epidemics,[1] at the time thought to be dengue, but lately regarded as amongst the epidemiological prodroma of the great pandemic of 1889–90.[2]

Dr. H. W. Leatham's lucid account, in your issue of last week (p. 1163), of an outbreak of similar nature is then of peculiar interest. At the Prince of Wales's General Hospital last month I saw two cases of the same type, and the confident opinion was then expressed that we should shortly have accounts from rural districts of such outbreaks as that now described by Dr. Leatham. At the time that the two cases I speak of were seen, there were, in the same wards, a case of "heliotrope pneumonia," a case of severe gastro-intestinal influenza followed by jaundice, and several cases of diverse nervous types. More recently a woman has been seen with lethargy, with double ptosis, with hand and foot pains and hæmorrhagic blebs of the "acrodynia" type who, at the post-mortem examination, displayed an acute hæmorrhagic encephalitis. Her illness commenced with "influenza" and broncho-pneumonia. Now, when one observer

[1] Brit. Med. Jour., 1888, ii., 1176.
[2] Cf. F. G. Crookshank, Influenza, p. 460.

in a large town or city sees, almost simultaneously, single or sparse cases of these different types, and we begin to have reports from rural districts of outbreaks conforming to one or other of these types, it is difficult not to think and speak of epidemic influenza. Our interest is quickened when, as now, we read of cattle disease spreading here and there, and we remember that, for six or nine months past, reports have arrived, if not from throughout the world from China to Peru, at any rate from Bombay to Brazil, of strange and new epidemics, somewhere thought to be dengue, somewhere thought to be influenza, but everywhere "baffling the doctors" who generally agree that it is indeed a "new disease." It was thus in 1888, and it was thus in 1917 and 1918.

It will be interesting to see what is now going to happen. It may be that we should expect such a revival of influenza as has not happened since 1919, but as did happen five or six years after the pandemic of 1889–90. It may be, on the other hand, that we are in for such a 20 or 30 years of influenza, its congeners and allies, as followed the pandemic of 1831. During great part of that time, in Creighton's words, the influenza years came "thick and fast." Again, it may be that nothing in particular is going to happen.

What, however, does seem desirable is, that frequent reports such as that of Dr. Leatham should be made by those who enjoy his opportunities—for it is in rural districts that *outbreaks* are best studied. In towns grouped cases are often missed, for the like individuals are often seen by different doctors, who do not recognise the epidemiological matrix, as it were, in which maladies, apparently so diverse as a pneumonia, a jaundice, an encephalitis, a gastro-enteritis, or a tonsillitis are embedded. At any rate, we can try to form some general idea of what is foreshadowed by the "certain liveliness" now in evidence in the epidemiological field.

I am, Sir, yours faithfully,

F. G. CROOKSHANK.

Wimpole-street, W., Nov. 26th, 1923.

THE ALBUMINURIA OF PREGNANCY.

To the Editor of THE LANCET.

SIR,—I am afraid Dr. J. W. Russell (THE LANCET, Nov. 17th, p. 1110) has misinterpreted the meaning of my letter (Nov. 10th, p. 1057). So far from contending "that the albuminuria of pregnancy is not likely to be explained on mechanical grounds to any great extent," my contention is that this condition is not likely to be explained on any other ground. Prof. F. Cook showed (Nov. 3rd, p. 1008) that the albuminuria of pregnancy may be at times of unirenal origin, when perhaps it is due to obstruction of the left renal vein. My point was that since this albuminuria is more often bilateral, and obstruction of the right renal vein cannot be so well advanced as that of the left as a cause, we are led to consider obstruction of the *renal capillaries* by *physical causes* as an explanation. Dr. Russell, perhaps, will admit that if obstruction of the renal vein causes albuminuria, obstruction of the renal capillaries—e.g., by a compression of the whole organ—may also do so. We have, indeed, proof that this is so. Thus, if the ureter be clamped and after a while released, albumin is present in the urine secreted. (In this and the following examples the capsule of the kidney acts as container.) In hydronephrosis the urine from the affected kidney contains albumin. Clamping the ureter, as Ludwig (1864) showed, causes a diminution in the flow of blood from the corresponding renal vein. The distension of the uriniferous tubules thus hinders the blood-flow through the renal capillaries. The diminution is so great that if the condition persists atrophy of the renal substance occurs. This cannot be explained by the distending pelvis of the kidney obstructing the renal vein.

It is generally held, I believe, that the albuminuria of pregnancy is due to a toxin. If this be so, it must be admitted as remarkable that the albuminuria of pregnancy, as Prof. Cook states, is "usually unaccompanied by any other deviation from the normal with the possible exception of œdema"—either "clinical" or "biochemical." Certainly, many pregnant women with albuminuria appear, and say they feel, in excellent health—as we know, the albumin is often only discovered by routine examination of the urine. Nor is this conception in line with the known fact that albumin often appears for the first time during labour; we cannot believe a specific poison, for the first time in the pregnancy, is let loose during or by this act. Similarly, the disappearance of the albumin by putting a pregnant albuminuric to bed, dieting and purging her, does not support this conception. It is, indeed, supposed that by such measures a toxin is eliminated and that thus the albuminuria is cured; but this is not the only or the more reasonable explanation. Unfortunately, it is not yet grasped that the physical forces of the body are reduced by such measures, and that circulatory changes of importance in organs by these means alone are determined. Muscular activity—e.g., tonus—(on which the blood pressure and other body pressures depend) is not the same on a starvation as on a full diet, or when resting as when working; how, then, as long as such forces are omitted from consideration, can we come at the truth? If such argument is applicable to the albuminuria of pregnancy it is, I submit, applicable to the albuminuria of other types—especially to those imputed to be physiological. Dr. Russell believes that many cases of albuminuria (of postural and other origin) will be shown to have a "renal pathology." The regret is that the teaching of that great natural experiment—pregnancy—has not as yet shed its light on internal medicine.

I am, Sir, yours faithfully,

R. H. PARAMORE, F.R.C.S. Eng.

Brook-street, W., Nov. 17th, 1923.

*** Mr. Paramore's letter was referred to Dr. Russell, who replies: "My apologies are due to Mr. Paramore. I was thinking entirely of 'unirenal' albuminuria, and should have used that adjective instead of 'mechanical.' But my slip has elicited a very interesting letter, and may therefore be the less regretted."—ED. L.

THE IMPORTANCE OF NASAL SINUS INFECTIONS.

To the Editor of THE LANCET.

SIR,—In reference to the two valuable papers recently published in THE LANCET on unrecognised maxillary sinus disease, the two following cases are worth record. In neither case had the presence of sinus empyema been suspected. Both show the paramount necessity for complete examination.

1. A man, aged 51, was sent to me for persistent pharyngitis. He had also a general septic rash, suffered from dyspepsia with occasional nausea and retching on waking in the morning, and complained of not having "felt himself" for some months. The breath was very offensive. He had undergone operation, under local anæsthesia, for nasal polypi (?) 11 months before consulting me. Anterior rhinoscopy showed a considerable turgescence of the left middle turbinal, and the electric nasopharyngoscope revealed enlargement of the posterior ends of the left middle and both inferior turbinals. There was no pus in the nasal chambers, nor did any appear with the head in the drainage position. There was marked pharyngitis, especially in the left lateral recess. There was some septic bridge-work on the left upper alveolus. Transillumination showed complete absence of the crescent on the left, and an X ray photograph proved both frontal sinuses to be clear, while the left antrum was obscured by a strong shadow. The left nasal wall of the antrum was punctured under general anæsthesia and the sinus washed out. The muco-pus it contained was extremely thick and stinking. The opening was enlarged by the removal of the nasal antral wall in its whole length. Recovery was uneventful, and two months after the operation the patient reported himself as "quite recovered."

2. A woman, aged 57, consulted me for recurrent aching in the right ear, and pain (without tenderness) in the course of the Eustachian tube. The symptom had been present, on and off, for about five months. Nothing abnormal could be

detected in either ear, either upon inspection or by functional tests. Beyond the admission of a feeling of general ill-being no other symptoms could be elicited. The upper teeth had been removed some years earlier and the patient was wearing a complete upper case. On examination of the nose there was a marked turgescence of the right middle turbinal. No pus was seen and none appeared after placing the head in the draining position. Transillumination showed a clear crescent on the left side, complete absence on the right. The antrum was washed out through a puncture in the nasal wall and recovery was rapid. There was a moderate quantity of fairly thick muco-pus. The ear pain appears to have been relieved immediately the tension in the antrum ceased.

In both cases no pus could be found in the nasal passages, nor was there any headache, although that symptom was specially inquired for.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY, F.R.C.S. Eng.,
Consulting Aural Surgeon to the London County Council and the St. James's Hospital, Balham, &c.

Welbeck-street, W., Nov. 20th, 1923.

NASAL SINUSITIS IN PHTHISIS.

To the Editor of THE LANCET.

SIR,—I agree with Dr. P. Watson-Williams that the wording of my remarks on the occurrence and production of laryngeal signs is too loose unless these remarks be regarded, not as a general statement of the question applicable to all forms of sinusitis, but as applying solely to sinusitis which simulates pulmonary tuberculosis. Dr. Watson-Williams thinks I attach too much value to the presence of pus and invites my attention to the more exact methods of investigating the sinuses by examining their contents microscopically. I frequently use the apparatus that he designed for this purpose and have found it most valuable. It opens up a field of research on the question of where the normal reaction of the mucous membrane to organisms extracted from the inspired air, and spreading from continuity of the mucous membrane to the sinuses, may be said to end and where sinusitis may be said to begin. It is most serviceable in conditions which may be described as sinus infection of a chronic nature, rather than sinusitis in which the organisms become symbiotic and produce toxic absorption leading to arthritis, without producing changes which can be recognised clinically as sinusitis. I do not think, however, that such conditions of the sinuses as are detectable only by microscopical examination can produce changes of such a nature that the secretion of muco-pus is sufficient to form a sputum and lead to simulation of pulmonary tuberculosis, though I agree that in some cases the pus mixes with watery solutions, if these are employed for irrigation, for which reason I now employ liquid paraffin.

Dr. Watson-Williams takes exception to my statement that frontal and ethmoidal sinusitis do not complicate the diagnosis of pulmonary tuberculosis and that sinusitis affecting the sphenoid has not been met with except in the presence of other sinusitis, and I agree that this statement is too wide in application if cases detectable only by microscopical methods are included. All that I am entitled to say is that out of over 200 examinations of the sinuses in patients with sinusitis in whom pulmonary tuberculosis had been diagnosed but in whom the diagnosis was in doubt, the sinusitis affected the maxillary and less commonly the maxillary and posterior ethmoidal and sphenoidal sinuses, and that where frontal sinusitis was present the patient complained of pain, the significance of which had been recognised by the physician examining the case. I do not think that sinusitis with secretion of muco-pus will be found to affect the anterior ethmoidal group unless there is at the same time some degree of maxillary sinusitis.

Dr. W. C. Rivers's letter in THE LANCET of Nov. 17th commenting upon my paper suggests differences of opinion on this question, which, from a perusal of his book to which he refers me, appear to be more apparent than real. He quotes Dr. Dan McKenzie as attributing purulent ethmoiditis to 10 out of 102 consumptives, but omits to quote the remainder of the same paragraph in his book (p. 142), in which he states that Skillern found secretion or pus in the washings of the antrum in 11 out of 100 tuberculous individuals. On p. 128 of the same book Dr. Rivers writes: The strong affinities of the nasal atrophy of consumptives to ozæna count against Moure's conception of it as a special rhinopathological condition of itself peculiar to *tuberculous* patients," which contradicts the statement of this author's views in his letter. Again, in his letter Dr. Rivers deprecates any packing of nasal sinuses in consumptives with antiseptics, whereas in his book (p. 132) he states that it is his practice in ozæna (in consumptives) to pack the nose with double cyanide ribbon gauze. I could give other instances, but I think I have said enough to show that the points of disagreement are only apparent. If during the course of the six years since the publication of his very carefully written book, Dr. Rivers has made observations that have caused him to alter the views there expressed, as his letter would suggest, I should be glad to learn of them.

I am, Sir, yours faithfully,

Birmingham, Nov. 22nd, 1923. A. LOWNDES YATES.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. F. C. B. Gittings is placed on Ret. List with the rank of Surg. Capt.

Surg. Lieut. F. L. H. MacDowel to be Surg. Lieut.-Comdr.

ROYAL ARMY MEDICAL CORPS.

Maj. G. W. Heron (secd. Foreign Office) retires, receiving a gratuity, and is granted the rank of Col.

K. Fletcher-Barrett to be Lt. (on prob.) and to be secd.

Temp. Capts. relinquishing their commns. and retaining the rank of Capt.: E. O. Gilkes and J. McGrath.

REGULAR RESERVE OF OFFICERS.

R.U. Rif.—Lt. J. M. Semple, late R.A.M.C., to be Lt.

TERRITORIAL ARMY.

Maj. P. Moxey, from General List, to be Lt.-Col.

ROYAL AIR FORCE.

J. E. Cox is granted a temporary commission as a Flight Lt.

CATHERINE GLADSTONE HOME.—This annexe to the London Hospital was officially opened at Mitcham, Surrey, on Nov. 19th, by Sir William Joynson-Hicks. The home, which is most comfortably furnished, in delightful surroundings, contains some 50 beds for women and children convalescents. Mr. William H. Baker, chairman of the Marie Celeste Samaritan Society of the London Hospital, described the gift of the Catherine Gladstone Home as a fitting climax to the long-standing interest of the Gladstone family in the hospital, which dated back to the cholera epidemic in 1866. Mrs. Gladstone, during the epidemic, was so touched by the plight of the children who were orphaned that she opened a home for them at Woodford, which was later removed to Mitcham. After her death the home was administered by trustees, who, a year ago, suggested that it should be handed over, with its endowments of about £1200 a year, to the London Hospital. As the House Committee could not meet the cost of upkeep the Samaritan Society came forward with a generous offer of help, and extensive alterations were made to meet modern requirements. Altogether about £8000 has been spent on equipment. In referring to the need the home would meet in hospital work, Sir W. Joynson-Hicks said that in the London Hospital a patient might have a better chance of recovery than in many nursing homes. In every great hospital the scientific side was coming to the front, and the great central hospital became more and more the place for diagnosis. The annexes would be the places where the cures were carried out, thus relieving the list of people waiting for admission. A bed cost £5 5s. a week in the London Hospital, and at Mitcham it only cost £2 a week. He saw in the future the London Hospital becoming a department for accidents and diagnosis, and the main work of healing conducted on the outskirts of London.

THE GENERAL MEDICAL COUNCIL.

THE winter session of the General Medical Council was opened on Nov. 27th, Sir DONALD MACALISTER presiding.

PRESIDENT'S ADDRESS.

The PRESIDENT began by regretting the untimely death of the assistant secretary, Mr. A. J. Cockington, who for 35 years was a member of the office staff. "None was more loyal and devoted," said the President. "His knowledge of our proceedings was encyclopædic in its range and accuracy. In my experience, and I believe in that of many other members and officers of the Council, though his knowledge was never obtruded, it was never found wanting when need arose. During the absence of Colonel King on active service, Mr. Cockington, as deputy registrar, carried on his shoulders the heavy administrative burden that the Council's multifarious war work entailed. He spared neither time nor labour in the effort to carry it through successfully, but I fear that his success was gained at the cost of permanent damage to his health."

Tributes to the Dead.

The President then recalled to memory two former members of the Council who had both recently passed away. Mr. Thomas Pridgin Teale and Dr. David White Finlay. The first, whose father was one of the original members appointed by the Crown in 1858, himself served as a Crown member for 24 years, from 1876 to 1901. "As a surgeon, sanitarian, teacher, and man of science," said the President, "his was a venerated name. Dr. David White Finlay, who was at one time inspector of medical examinations, was a member of the Council from 1901 until 1911. He won," said the President, "a high reputation as a physician, and a teacher of physicians, both in London and in Aberdeen. After retiring 12 years ago from the Regius chair in the latter university, he returned to the Clyde which he loved, but notwithstanding his advanced age, he served as commandant of a Red Cross hospital in Glasgow during the war with characteristic thoroughness and efficiency."

Medical Education in India.

Sir Donald MacAlister continued: The Executive Committee, thanks to the good offices of Sir Norman Walker, had the privilege yesterday of meeting Lieut.-Colonel Needham, who has been appointed by the Indian Government and approved by the Council as the official inspector of the Indian universities and Colleges of medicine, and of discussing with him the many important questions that have arisen regarding the conditions of recognition, for the purposes of the British Register, of Indian medical degrees. The Government has placed him on special duty in order that he may attend the meetings of the Executive Committee at this session, and discuss these questions with us in person. The Council will, I know, be glad to welcome him here, on account of the distinguished position he holds in the Indian Medical Service and of the responsible functions he has undertaken for the benefit of medical education in India. I trust that during the week he may obtain all such information concerning the Council's methods and procedure as he desires in furtherance of his efforts to coördinate our standards in all the essential branches of professional training for registrable qualifications with the standards hitherto current in the Indian universities and colleges. We in our turn will profit by learning from him what improvements in their educational arrangements have been already made or are desiderated by these important bodies, in order that the whole course of study and examinations for the degrees they desire to be registrable in this country may continue to justify our official recognition. The reports presented to the Executive Committee, and published with the minutes of last June, show that in regard to certain essential features of their course the universities themselves are fully aware that improvements are necessary, even apart from the consideration of external recognition I need mention, as examples, only such matters as the excessive number of students admitted to the medical colleges of certain of the universities; the limitation, to two years, of hospital study after the examination in anatomy and physiology; and the inadequate facilities for practical training in midwifery. The Council will readily acknowledge the desire which has been manifested by the several Indian universities to remedy such deficiencies, notwithstanding difficulties due to local conditions and local organisation; but it must urge strongly the necessity of prompt and effective action on the part of these authorities, if their laudable desire is to be fulfilled within a reasonable time.

If the question were simply one of a suitable professional training for practitioners, *practising in India* under Indian conditions, the Indian Universities, Colleges, and Schools, with their special knowledge of local requirements, would naturally be the best and indeed the only judges. From this point of view India is autonomous, and the Council has neither the wish nor the power to intervene. But when the Council is called on to recognise an Indian qualification for registration *in this country*, it is bound by Act of Parliament to inquire into the conditions under which any such qualification is granted. It is bound to require that the qualification shall furnish a sufficient guarantee of the knowledge and skill, in medicine, in surgery, and in midwifery, requisite for efficient practice, not in India alone, but in the United Kingdom, and in the other parts of the world with which this country has established reciprocity of practice. If it is found, in respect of any particular degree, that the guarantee is no longer sufficient, the Council would be in default of its statutory duty, and so be liable to supersession by the Privy Council, were it to continue to recognise such a degree as registrable and therefore valid outside of India.

It is on this ground only that the Council is by law entrusted with a specific responsibility as regards qualifications granted elsewhere than in the United Kingdom. It is on this ground only that it has requested from the Indian Government the special facilities for inquiry and inspection which have been placed at its disposal, and which have been so ably and sympathetically utilised, in the best interest of Indian medicine, by Lieut.-Colonel Needham. We have to await his further reports—reports, as we hope, of very substantial progress—before deciding at the next session what further steps we shall take regarding some of the qualifications granted in India.

Status of Practitioners Abroad.

The Executive Committee is continuing its negotiations with the Provincial medical authorities in Canada, with a view to formulating a uniform and comprehensive statement of the conditions on which recognition shall in future be accorded to diplomas and degrees registrable in the Dominion. A considerable measure of agreement has been reached, and the Committee expects that by next session outstanding difficulties will be removed and a satisfactory arrangement will be completed.

Communications have also been received and answered, through the Privy Council and the Foreign Office, concerning the status of British practitioners in Italy, Greece, and Turkey. There is reason to believe that the answers have been found useful.

Relation to Midwives.

We have received from the Ministry of Health a copy of an important decision of the High Court on a case in which an uncertified woman was charged with a breach of the Midwives Act, 1902. It was alleged on her behalf that she had not attended women in childbirth otherwise than "under the direction of a qualified medical practitioner," and so was not guilty of infringing the Act. Several practitioners testified that though they had not attended the women before confinement, had given no instructions to the uncertified person, and had not been

present at the birth, they had attended the patients subsequently, and that thus the uncertified person had acted under their "direction." The Court ruled that in such cases there must be "a real and not a mere nominal direction." This decision will strengthen the hands of the Council in dealing with cases in which practitioners are alleged to have disregarded its warning notices on this subject, and of having "knowingly enabled uncertified women, on pretence that such women were under their direction, to attend women in childbirth, contrary to the law." Steps have been taken to make this decision known to practitioners and supervising authorities, who have made inquiries on the subject. It is probable that some amendment of the Act, setting forth in precise terms that the "direction" of the practitioner must be immediate and personal, or, in the words of the judgment, "real and not nominal," will be necessary to prevent the continuance of abuse.

Order of Business.

The inspection of examinations for dental qualifications, which you ordered to be instituted at the last session, is in progress. Reports of two or three such examinations have been received, but it is thought advisable by the Committee in charge that the series should be more complete before the reports are formally brought before you. The Council will thereby be in a better position to form a comparative judgment on methods and standards.

In accordance with precedent, most of your time, at this November session, will be occupied in hearing cases of discipline under Section 29 of the Medical Act, 1858. A number are cases of conviction by the ordinary courts; a few arise from complaints of professional misconduct in contravention of one or other of your warning notices. The Dental Board also will report to you their findings against certain dental practitioners, in pursuance of the Dentists Act, 1921. So far as I am able to gather, none of the disciplinary cases raise general questions of an unfamiliar kind, but the special points of each will, of course, require and receive your careful consideration.

THE PARLIAMENTARY ELECTION:
MEDICAL CANDIDATES.

NOMINATIONS were completed on Nov. 26th and two medical men have been returned unopposed to the House of Commons.

Returned Unopposed.	*Constituency.*	*Party.*
Sir George Berry†	Scottish Universities..	Conservative.
Prof. Thomas Sinclair ..	Queen's University, Belfast	Conservative.

Sir George Berry, along with Sir Henry Craik—a good friend to medicine—sat for the same constituency in the last House of Commons. In his election address he expresses his intention to watch and, as far as possible, promote the special interests of the universities and particularly of the medical profession, independent of party considerations..

Prof. Sinclair, who follows Sir William Whitla in representing Belfast University, occupied the chair of surgery in Queen's College, in succession to the late Dr. Alexander Gordon, for 37 years, retiring at the close of last session. Recently he had acted as registrar and vice-chancellor in the Queen's University. He is a member of the General Medical Council and of the Senate of Northern Ireland, as well as consulting surgeon to the Royal Victoria Hospital, Belfast, the Ulster Hospital for Women and Children, the Forster Green Hospital, and the County Antrim Infirmary. He served with distinction as consulting surgeon during the war, and received the honour of C.B.

At the General Election, which takes place on Dec. 6th, the following medical candidates will seek election. Those who sat in the last Parliament are indicated by a dagger, and those who stood unsuccessfully by an asterisk.

Candidate.	*Constituency.*	*Party.*
Dr. Ethel Bentham* ..	Islington, East	Labour.
Dr. H. B. Bates*	Lancaster, Newton ..	Conservative.
Dr. W. A. Chapple† ..	Dumfries	Liberal.
Dr. R. Dunstan*	Birmingham, Ladywood	Labour.
Capt. W. E. Elliot† ..	Lanark, Lanark.. ..	Conservative.
Dr. F. E. Fremantle† ..	Hertford, Albans ..	Conservative.
Dr. O. Gleeson	Portsmouth, North ..	Labour.
Dr. L. Haden Guest* ..	Southwark, North ..	Labour.
Mr. Somerville Hastings*	Reading	Labour.
Dr. G. B. Hillman ..	Yorks W.R., Normanton	Conservative.
Sir Henry Lunn	Brighton	Liberal.
Dr. J. E. Molson†	Lincoln, Gainsborough	Conservative.
Dr. H. B. Morgan* ..	Camberwell, North-West	Labour.
Dr. A. G. Newell	Tottenham, South ..	Liberal.
Dr. R. L. Ridge	Middlesex, Enfield ..	Liberal.
Sir Sydney Russell-Wells†	London University ..	Conservative.
Dr. Alfred Salter†	Bermondsey, West ..	Labour.
Dr. R. W. Simpson* ..	Newcastle-on-Tyne, North	Liberal.
Dr. E. G. Spero*	Stoke Newington ..	Liberal.
Dr. Thomas Watts† ..	Manchester, Withington	Conservative.
Dr. J. H. Williams† ..	Carmarthen, Llanelly .	Labour.
Dr. R. McNair Wilson* .	Essex, Saffron Walden	Liberal.

Some Personal Records: New Candidates.

Of the new medical candidates, Olaf Gleeson, M.R.C.S. Eng., who is contesting Portsmouth in the Labour interest, is an old Westminster Hospital student who qualified in 1915, and served as a captain in the R.A.M.C.(T.)—George Brown Hillman, M.B.E., L.M.S.S.A., who is Conservative candidate for the Normanton Division of Yorkshire, qualified in 1892, is honorary captain, R.A.M.C., and medical referee to the Ministry of Pensions. As a member of the West Riding County Council Public Health Committee he has devoted much time to improving the present methods of dealing with tuberculosis and in work connected with child welfare.—Alfred George Newell, M.D. Glasg., D.P.H., qualified in 1894, and has occupied important public health appointments abroad, being at one time professor of hygiene at the Lahore Medical College. During the war he was on the staff of the Royal Waterloo Hospital, and he was chairman last year of the Middlesex Division of the British Medical Association.

Candidates for Re-election.

We have on a previous occasion set out the reasons for which many of these are seeking Parliamentary suffrage. Dr. Ethel Bentham will continue to emphasise the importance of housing in relation to health.—Dr. Dunstan, as a medical practitioner working in a poor district and impressed with the close association between the evils of present-day society and the incidence of disease and death, regards it as useless to try to alleviate disease and suffering without at the same time dealing drastically with the underlying economic cause.—Dr. Fremantle aims at reorganising in one great scheme the measures for insuring people against ill-health, unemployment, and old age, and removing any discouragement to thrift. He hopes to see incorporated in this scheme the long-needed reform of the Poor-law.—Mr. Hastings, who is now standing for Reading, is laying special stress on the social programme, most of all on the needs of the coming generation. He has found evidence that unemployment has resulted in deterioration in the physical condition of the children of the unemployed. He holds the view that a well-fed, well-housed, and well-educated democracy can be safely trusted to look after its own destiny.—Dr. Salter is pledged to deal with unemployment and housing, the two greatest social sores of the moment. He derives his politics from his religion and aims at establishing peace and goodwill on earth.—Sir S. Russell-Wells desires to see modifications in the panel system. He will oppose any attempt to place the doctors under the heel of approved societies or to convert the profession into a sweated industry.

Support.

The Parliamentary Elections Committee of the British Medical Association is supporting the candidature of Sir S. Russell-Wells, Dr. Watts, Dr. Hillman, and Dr. Newell. The Committee has also conveyed

its best wishes for success in their candidature to the following: Dr. Chapple, Lieut.-Colonel Fremantle, Captain Elliot, and Major Molson. The Federation of Medical and Allied Services is placing its machinery at the disposal of all the medical candidates who were successful last year as well as that of others who desire it.

Medical News.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on Nov. 21st Mr. W. E. Le Gros Clark was appointed as from Jan. 1st, 1924, to the newly-instituted Readership in Anatomy tenable at St. Bartholomew's Hospital Medical College. The D.Sc. in Embryology was conferred on Miss Margaret Tribe (University and King's Colleges) for a thesis entitled the Development of the Hepatic Venous System and the Postcaval Vein in the Marsupialia. It was resolved that the Physiological Laboratory Library should be kept together as part of the University Library and be developed in connexion therewith as a memorial to the late Prof. A. D. Waller.

At examinations held recently the following candidates were successful:—

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

With special knowledge of Psychiatry.—Basil W. Brown, Harold E. Brown, Isabel F. King, Thomas Lindsay, and John Wall.

SMALL-POX IN ENGLAND AND WALES.—During the week ended Nov. 17th 44 cases of small-pox were reported to the following sanitary authorities: Derby 15 (Heanor 2, Ripley 1, Blackwell R.D. 12); Durham 1 (Gateshead); Gloucestershire 11 (Gloucester 6, East Dean 5); Kent 1 (Chatham); Notts 13 (Hucknall 8, Basford R.D. 5); Yorks W.R. 3 (Adwick-le-Street).

OLD EPSOMIAN CLUB.—The annual dinner will take place on Dec. 13th, at 7.30 P.M., at the Trocadero Restaurant, when Mr. W. Æ. Mackay (Carr House, 1886–89) will be in the chair. The price of the dinner will be 10s. 6*d.* (exclusive of wine), and will be collected at the table. Members intending to be present are requested to send their names to the hon. sec., S. Maynard Smith, 49, Wimpole-street, W. 1, as soon as possible, giving the names of any members near whom they would like to sit. The annual meeting will be held at the restaurant before the dinner, Dr. H. F. Ealand, the retiring President, taking the chair at 6.30 P.M.

ROYAL SANITARY INSTITUTE.—A conference of veterinary officials will be held at 3 P.M. on Dec. 14th, at 90, Buckingham Palace-road, London, S.W., when Alderman W. Phene Neal (late chairman of Cattle Markets Committee, City of London) will open a discussion on Tuberculosis in Cattle and the Desirability of allowing the introduction of Breeding Heifers from Canada if Certified Free from Tuberculosis. The chair will be taken by Dr. Louis C. Parkes (Chairman of Council).

The next Congress of the Institute will be held at Liverpool from July 14th to 19th, 1924, by invitation of the Lord Mayor and City Council.

PRIZE FOR CANCER RESEARCH.—The committee of the Christie Hospital is offering a prize of £300 for Cancer Research. Candidates must be qualified in medicine or in science cognate to medicine, and must submit evidence of original research work bearing on cancer done and projected, which shall in the opinion of the assessors qualify him for the prize. The object of the prize is to support research work already in progress. The assessors will take into consideration promising work which might fail for want of financial help. The competition is open to research workers of any nationality. Applications must be sent to the chairman of the Medical Board, Christie Hospital, Manchester, on or before Dec. 31st, 1924.

THE LATE DR. WILLIAM GOWANS.—Dr. Gowans, a well-known South Shields medical practitioner, honorary surgeon to the Ingham Infirmary, and president of the North of England Branch of the British Medical Association, died from septicæmia following a cut thumb while stropping a razor. Qualifying with the L.R.C.P. and L.R.C.S. Edin. in 1868, Dr. Gowans entered on general practice and obtained the F.R.C.S. Edin in 1883. He graduated M.D. at Durham University in 1886. A vice-president of the Northumberland and Durham Medical Society, he was surgeon to H.M.S. *Wellesley* training ship, and at one time was an honorary surgeon and a commanding officer to the old 3rd Durham Artillery Volunteers. He had been a justice of the peace since 1892.

NATIONAL HEALTH INSURANCE: COURT OF INQUIRY. The Court of Inquiry to be appointed by the Minister of Health and the Secretary for Scotland, with reference to the amount of the capitation fee to be paid, as from Jan. 1st, 1924, to practitioners serving under the National Health Insurance Scheme will be composed of as follows: Chairman, Mr. T. R. Hughes, K.C. (Chairman of the General Council of the Bar) with Mr. F. C. Goodenough (Chairman of Barclay's Bank) and Sir Josiah Stamp, K.B.E. The last-named was one of the arbitrators appointed by the Government to deal with the question in 1920. The terms of reference to the Committee will be published later.

Mr. Dudley Cox Trott, F.R.C.S. Eng., has been appointed an unofficial member of the Executive Council of the Bermudas or Somers Islands.

CHELSEA CLINICAL SOCIETY.—The first meeting of the session took place at St. George's Hospital on Nov. 20th, Dr. G. Crewsdon Thomas, the President, in the chair. In the absence of Sir Sydney Russell-Wells, owing to illness, a discussion on the Treatment of the Failing Heart was opened by Dr. John Parkinson, supported by Dr. C. E. Sundell and Dr. Robert Hutchison. Drs. Gordon Lane, H. A. Ellis, K. Eckenstein, J. D. Rolleston, G. H. Hunt, and the President took part in the discussion.

ABERDEEN MEDICO-CHIRURGICAL SOCIETY.—The annual business meeting of this Society was held on Nov. 22nd, when the following office-bearers were appointed:—

President: Dr. George M. Duncan. Vice-President: Dr. Peter Howie. Secretary: Dr. H. Edgar Smith. Recording Secretary: Dr. H. Ross Souper. Assistant Secretary: Dr. Robert Richards. Treasurer: Dr. George Rose. Librarian: Dr. W. Clark Souter. Editor of Transactions: Mr. G. H. Colt. Members of Council: Dr. Alexander Ogston, Dr. James Crombie, Dr. W. Clark Souter, and Dr. William Brown.

INCORPORATED VERMIN REPRESSION SOCIETY AND COLLEGE OF PESTOLOGY.—At the annual dinner of the Society and College held on Nov. 21st, Lord Aberconway recalled the fact that 15 years ago he introduced the first "anti-rats" Bill into the House of Commons. To-day their Society occupied a unique position in the world; they could claim to have originated the scientific instructional film, and their anti-rat film was acknowledged by the Government to be the finest propaganda of its kind. The Society was known by its child the Rats Act, and by its lectures and writings, having been consulted by the Governments of Poland, France, New Zealand, America, Greece, Egypt, and the Gold Coast. Their concern was not only with rats and mice, whose depredations cost the British Isles well over £40,000,000 per annum, but also with vermin generally; through associated societies they had been able to arouse public opinion to the danger underlying the existence of body vermin. The year's balance-sheet told a story of enthusiastic devotion on the part of unpaid officials, and a paucity of funds which starved the usefulness of the Society.

LONDON SCHOOL OF TROPICAL MEDICINE: SCHOOL DINNER.—The annual dinner of the Seamen's Hospital Society, being the London School of Tropical Medicine, took place at the Hotel Victoria, Northumberland-avenue, on Nov. 21st, Sir Ion Hamilton Benn occupying the chair. In proposing "The School," in its twenty-fourth year of existence, the Chairman reminded his hearers of its two great benefactors, Joseph Chamberlain and Patrick Manson, and went on to enumerate the 20 scientific expeditions which the School had arranged. Dr. J. G. Thomson was but lately returned from Rhodesia with a fund of new knowledge regarding blackwater fever, while Dr. and Mrs. P. A. Buxton, with Mr. G. W. Hopkins had just started for Samoa in an endeavour to solve the problem of filariasis. He spoke of the Rockefeller Institute and its newly appointed director, Dr. Andrew Balfour, in which the School might indeed lose some of its autonomy, albeit this really rested with the men who staffed the School. Sir Arthur Clarke proposed "The Guests," among whom were Sir James Allen (High Commissioner for New Zealand), Surgeon Vice-Admiral J. Chambers, Sir William Leishman, Sir Walter Fletcher, and Lord Devonport. He congratulated the last-named on the achievement of having collected by aided effort the remarkable sum of £200,000 for the Seamen's Hospital. The School was, he said, retaining its name within the Rockefeller Institute in honour of the memory of Manson. Sir James Allen, in reply, spoke of the generous help offered to New Zealand by the School and warmly welcomed the Buxton-Hopkins expedition. Dr. J. M. H. Macleod proposed "The Chairman," who briefly replied. The intervals were filled up with an agreeable programme of music provided by Dr. T. Goodey and others.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—The first general meeting of the session will be held on Dec. 7th, 8.30 P.M., at 11, Chandos-street, London, W., when the presidential address will be given by Lieut.-Colonel L. W. Harrison.

ROYAL NORTHERN GROUP OF HOSPITALS. — A festival dinner was held in the Mansion House on Nov. 21st with the object of raising money to open 70 beds which had been closed owing to the strained financial position of the hospitals. The chair was taken by Earl Beatty, Admiral of the Fleet, who made a strong appeal on behalf of the Royal Northern Group of Hospitals, which, he said, had grown from the humble origin of one bed in a single room in a little side street in North London to its present great efficiency and size, now serving a population of a million. In reply to Earl Beatty's toast of "Success to the Hospital," Lord Northampton (chairman of the hospital) said that while there had been an increase in the cost of hospital services, their income had also increased, thanks largely to the ingenious schemes of their secretary, Mr. Gilbert G. Panter. Still, there was a deficit for the year of about £15,000. The closure of 70 beds was calculated to save this sum, but at the same time it meant that 1000 cases had to go untreated. Expansion, not reduction, was needed in North London. The toast of the Lord Mayor and Corporation was given by Sir Philip Sassoon, supported by the Rev. Basil Bourchier, and acknowledged by the Lord Mayor; and that of the chairman was given by Lord Riddell. During the dinner guests were invited individually to promise contributions towards the hospital funds. The response was liberal, and the secretary was able to announce later in the evening the gratifying total of £11,643. The cost of the dinner had been generously defrayed by Lord Northampton.

THE UNIVERSITY OF EDINBURGH GRADUATES IN LONDON CLUB.—The 200th dinner of the Club, held in the Connaught Rooms on Nov. 23rd, was attended by some 400 members and their guests, the Rt. Hon. the Earl of Balfour in the chair. In proposing the toast of "The Alma Mater and the Edinburgh University Club of London," Lord Balfour said that our great educational institutions had two antitheses to reconcile—namely, general culture and accurate scientific knowledge—and every year this problem became more insistent. "Many will be disposed to admit," he continued, "that it is not merely—not mainly—in the lecture-room that educational gains have been chiefly acquired. Lectures do much, contact with great teachers does more, but most of all, as we look back, do students learn from each other. It is the collision of individual character and interest that makes university training a unique benefit. It is not merely hours spent in hard study that fit a man for the battle that each of us has to fight. Hours of idleness, hours of strenuous enjoyment, the teachings of equals in age, are great educational instruments." Sir James Crichton-Browne (who was chairman in 1889) proposed "Our Guests," to which Sir Humphry Rolleston (President, Royal College of Physicians) and Sir Aston Webb (President, Royal Academy) replied. In giving the health of the chairman, Lord Dunedin spoke of the affection which Lord Balfour inspired in all those with whom he came into contact. The toast was received with musical honours and Lord Balfour, in reply, spoke appreciatively of his friendship with Lord Dunedin.

BRIGHTON WATER-SUPPLY.—The house shortage at Brighton has become so acute that residences of the bungalow type are being erected wholesale on the confines of the town where in normal times and in normal circumstances such habitations would never have been considered. Questions of water-supply and drainage have been more or less left to take care of themselves. So many bungalows have been erected in one particular locality that there is the possibility of their becoming a menace to the water-supply of Brighton. Patcham is one of the important sources of supply and, acting on the advice of the waterworks engineer, the corporation has decided to take immediate steps to acquire all the lands in the neighbourhood of the pumping station whereon houses are now being built, or are likely to be built in the future, which, if erected without regard to proper drainage conditions, might affect the water-supply. Furthermore, the corporation has decided to seek powers to make by-laws by which they may be able to control all works of drainage in connexion with building operations upon lands in the neighbourhood of their pumping stations so as to maintain the absolute purity of the water-supply. Patcham station is for the moment the immediate objective for the powers sought, but these powers will soon be needed, for the same reason, in respect of the five other pumping stations which are scattered over the South Downs. The Brighton corporation's water area covers no fewer than 44½ square miles, with a resident population of upwards of 200,000, a figure greatly increased during the summer months by the vast numbers of holiday visitors.

INFLUENCE OF ENVIRONMENT ON THE LIFE OF BACTERIA.—A course of five lectures on this subject will be given by Dr. F. W. Twort, superintendent of the Brown Institution, in the theatre of the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C., on Dec. 11th, 13th, 17th, 18th, and 19th, at 4 P.M. Admission is free without ticket.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—A meeting of the Metropolitan and Home Counties Maternity and Child Welfare Sub-Group will be held at 1, Upper Montague-street, Russell-square, W.C., on Dec. 7th, at 5.30 P.M., when Dr. J. W. Carr will read a paper on Signs and Symptoms of Tuberculosis of the Respiratory System in Children under Five. The meeting is open to all members of the medical profession.

COMMISSIONS IN THE R.A.M.C.—An examination for not fewer than 40 commissions in the Royal Army Medical Corps will be held on Jan. 30th next. Applications should be made to the Secretary of the War Office not later than Jan. 20th, and the presence of candidates will be required in London from Jan. 28th. Meantime those intending to compete can obtain a full statement of the duties and emoluments of the service on making written application to the Secretary, War Office, Whitehall, London, S.W. 1.

MEDICAL BENEFIT FINANCE.—In an official statement issued on Nov. 24th the Minister of Health says: Many approved societies' representatives maintain that no greater sum than 7*s.* 3*d.* per member can be taken from the funds of societies without curtailing either the ordinary cash benefits or the additional cash benefits which are already provided for their members. The Government actuary has advised that societies in general can find anything up to 8*s.* 6*d.* from their funds for the next five years without endangering the continuance of existing benefits, including additional benefits already in operation.

ROYAL DENTAL HOSPITAL OF LONDON.—The annual dinner of the staff, and past and present students of the hospital, was held in the Trocadero Restaurant, on Saturday, Nov. 24th. The company numbered about 200, Mr. G. Northcroft, L.D.S., presiding. The Chairman, in the course of his toast to "The Past and Present Students of the Royal Dental Hospital and Dental School," announced that playing fields had now been acquired for the use of the school. In replying, the Dean, Mr. H. Stobie, L.D.S., referred to the appointment of a lecturer in radiology, and paid an appreciative tribute to his colleague, Mr. W. H. Dolamore, L.D.S., who was retiring from the teaching staff. He spoke of Mr. Dolamore as one of the finest teachers the school had ever had, a man whose initiative and determination in the face of opposition had achieved much in the interests of all dental students.

THE LATE DR. A. J. STILES.—The death occurred on Nov. 21st, at Spalding, Lincolnshire, of Dr. Arthur Jalland Stiles, in his sixty-fourth year. He graduated M.B., C.M. with distinction at Edinburgh University in 1883, where, three years later, he obtained his M.D. with commendation. In 1883 he was also admitted L.M.R.C.P.I., and the following year M.R.C.S. Eng. and L.M. Rotunda Hospital, Dublin. Dr. Stiles was one of the best known practitioners in Lincolnshire and one of the most active public men in Spalding. He was a magistrate for the Elloe division of Lincolnshire, a governor of Spalding Grammar School, a trustee of Spalding Hospital, and was associated with many other public bodies. Dr. Stiles was a brother of Sir Harold Stiles, of Edinburgh, and both his father and his grandfather practised in South Lincolnshire.

AUGUSTUS AND ALICE WALLER MEMORIAL.—A representative meeting held at the Royal Society of Medicine on June 1st last, under the chairmanship of Sir Edward Sharpey Schafer, resolved to establish a memorial to the late Prof. Augustus D. Waller, F.R.S., and Mrs. Waller, in recognition of their life-long devotion to physiological investigation. The memorial is to take the form of a fund to be used for the encouragement of scientific research. Its administration is to be entrusted to the Council of the London (R.F.H.) School of Medicine for Women. Since this meeting it has been suggested that an additional memorial might suitably be established at St. Mary's Hospital Medical School in the form of a research room, to be called the Waller Research Laboratory, in connexion with the physiological department. An influential committee has been formed to give effect to the suggestions, and it is hoped that a sum of £5000 may be raised; £1300 have already been subscribed. Subscriptions should be sent to the Hon. Treasurer, Prof. J. Mellanby, St. Thomas's Hospital Medical School, London S.E. 1, and if it is desired that donations, or any part of them, should be allocated to the St. Mary's Memorial, this should be expressed.

LONDON JEWISH HOSPITAL.—A festival dinner was held in the Connaught Rooms on Nov. 26th, Sir Humphry Rolleston in the chair. In proposing the toast of the London Jewish Hospital, the chairman emphasised the need of such a hospital in London, where there were a quarter of a million Jews. The hospital provided 50 beds and met a great need not only to the Jews, for of 52,000 out-patient attendances in 1922 about 40 per cent. were Gentiles. "To the excellence of the staff, its accommodation, X ray installation, operating theatre," he said, "I can testify with confidence, and more valuable than a personal testimonial is the practical proof of recognition by King Edward VII. Hospital, the Saturday and the Sunday Funds for financial help, and by its acceptance as a complete training school for nurses by the General Nursing Council for England and Wales. The hospital is not nearly finished, but there is a debt of already £10,000. Not only is the original plan not yet completed, but extension of the out-patient department is becoming urgent." The health of the Guests was proposed by the Chief Rabbi, the Very Rev. Dr. J. H. Herz, and Sir John Bland-Sutton replied to the toast of the Medical Profession.

THE LATE MR. G. T. BROOKSBANK JAMES.—George Thomas Brooksbank James, who died at Chichester on Nov. 15th at the age of 56, received his medical education at Westminster Hospital, where he gained the entrance scholarship and was admitted L.R.C.P. Lond. and M.R.C.S. Eng. in 1890. He held the resident posts of house surgeon and house physician at Westminster Hospital, and then turned his attention to ophthalmology. He obtained the F.R.C.S. in 1896, and in 1899 was appointed honorary assistant surgeon to the Royal Eye Hospital, Southwark, becoming honorary surgeon five years later. In 1903 he was appointed assistant ophthalmic surgeon to Westminster Hospital, becoming full surgeon in 1914. He spent part of every week at Eastbourne, where he was honorary ophthalmic surgeon to the Princess Alice Hospital. An as ophthalmologist he was a keen observer and a neat and precise operator. Systematic teaching did not much interest him, but when he had occasion to give a post-graduate lecture, it was a model of careful preparation and exhaustive treatment of the subject. He was especially interested in binocular vision and squint, a subject upon which he made many ingenious and original observations, some of which were reported in THE LANCET (1909) and in the Transactions of the Ophthalmological Society (1909). He spent much time and energy in devising new apparatus, but his modesty prevented his exhibiting his ideas to the profession or even to his immediate colleagues. Another subject in which he was keenly interested was that of glaucoma, and he described in 1912 a new method of operating for this, a method which he employed with great success. On those who worked with him he left the impression of an unusually original and versatile thinker.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY, Burlington House, Piccadilly, W.
THURSDAY, Dec. 6th.—At 4.30 P.M.
Papers to be read.—E. G. T. Liddell and Sir Charles Sherrington, Pres., R.S.: Recruitment Type of Reflexes. G. S. Carter: The Structure and Movements of the Latero-Frontal Cilia of the Gills of Mytilus. (Communicated by Prof. J. S. Gardiner.)
Papers to be read in title only.—V. B. Wigglesworth and C. E. Woodrow: The Relation between the Phosphate in Blood and Urine. (Communicated by Prof. F. G. Hopkins.) J. B. S. Haldane, V. B. Wigglesworth, and C. E. Woodrow: The Effect of Reaction Changes on Human Inorganic Metabolism. (Communicated by Prof. F. G. Hopkins.) J. B. S. Haldane, V. B. Wigglesworth, and C. E. Woodrow: The Effect of Reaction Changes on Human Carbohydrate and Oxygen Metabolism. (Communicated by Prof. F. G. Hopkins.) J. A. Campbell: Concerning the Influence of Atmospheric Conditions upon the Pulse-rate and "Oxygen-Debt" after Running. (Communicated by Prof. L. Hill.) J. Gray: The Mechanism of Ciliary Movement, IV. The Relation of Ciliary Activity of Oxygen Consumption. (Communicated by Prof. J. S. Gardiner.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, Dec. 3rd.

OCCASIONAL LECTURE: at 5.30 P.M.
Dr. Strandberg (Copenhagen): Treatment of Tuberculosis of the Nose and Throat by Finsen Light Baths: results (with epidiascopic illustrations).
Members of the Sections of Electro-therapeutics, Laryngology, and Medicine are specially invited to attend this lecture.

TROPICAL DISEASES AND PARASITOLOGY: at 8.30 P.M.
Communication:
Dr. Bamforth: Note on a Small Outbreak of Dysentery associated with an unusual bacillus.
Discussion:
On Sprue and Cœliac Disease. To be opened by Sir Leonard Rogers. Dr. Aldo Castellani, Dr. Reginald Miller, Dr. H. H. Scott, Dr. S. Arthur Powell, Lieut.-Colonel W. P. MacArthur, and others will speak.
Members of other Sections, and especially of the Section for the Study of Disease in Children, are cordially invited to attend.

Tuesday, Dec. 4th.

ORTHOPÆDICS: at 5.30 P.M. (Cases at 5 P.M.)
Discussion:
On Myositis Ossificans Traumatica. To be opened by Sir George Makins.
Fellows and Members are invited to show patients, radiographs, or specimens illustrating the subject under discussion.

PATHOLOGY: at 8.30 P.M. in the Pathological Dept., University College Hospital Medical School, Gower-street, W.C. 1.
Communications, &c.:
Dr. G. W. Goodhart: Achlorhydria and Achylia Gastrica.
Dr. Cecil Price-Jones: Contact Hæmolysis.
Dr. A. M. H. Gray: Chalky Tumours of Skin.
Mr. R. Grant: Bicuspid Aortic Valves and Subacute Infective Endocarditis.
Mr. V. R. Khanolkar: Non-specific Training of Antibody Production.
Dr. J. W. McNee: Experiments on Bile-pigment Formation.
Mr. W. G. Barnard: Pathological specimens.

Wednesday, Dec. 5th.

SURGERY: at 5.30 P.M. (Cases at 5 P.M.)
Pathological and Clinical Meeting:
Members are invited to bring patients and pathological specimens, and to send particulars of these to the Hon. Secretary (Mr. H. W. Carson, 111, Harley-street, W.), as soon as possible, but in any case not later than Dec. 3rd.
Patients should be in attendance by 5 P.M., and it would greatly facilitate arrangements if pathological specimens were accompanied by short descriptive labels.

Thursday, Dec. 6th.

OCCASIONAL LECTURE: at 5.30 P.M.
Sir Jagadis Bose: Assimilation and Circulation in Plants (with demonstration of apparatus).

OBSTETRICS AND GYNÆCOLOGY: at 8 P.M.
Specimens:
Mr. T. G. Stevens: (1) Endothelioma of Bartholin's Gland; (2) a Very Early Stage of a Papilliferous Growth in an Ovarian Cyst.
Mr. J. Bright Banister: (1) Sarcoma of the Fallopian Tube; (2) Carcinoma of the Fallopian Tube; (3) Ruptured Cæsarean Section Scar.
Short Communication:
Dr. Victor Lack: A case of Cyst Development in an Ovarian Graft.
Papers:
Dr. T. I. Candy: Radiography of the Fœtus in Utero.
Dr. Geoffrey Fildes: Radiography of the Fœtus in Utero.
Demonstration:
Prof. Louise McIlroy: Diagnosis of Pregnancy by X Rays

Friday, Dec. 7th.

LARYNGOLOGY: at 5 P.M. (Cases at 4 P.M.)
Cases and specimens will be shown by Dr. Russ Wood, Mr. Scott Ridout, Mr. Peters, Dr. Dan McKenzie, Dr. Cathcart, Sir James Dundas-Grant, Mr. T. B. Layton, and others.

LARYNGOLOGY: at 8.30 P.M.
ANÆSTHETICS: ,,
ODONTOLOGY: ,,
OPHTHALMOLOGY: ,,
OTOLOGY: ,,
SURGERY: ,,
Joint Discussion:
On the Comparative Value of Cocaine Substitutes. To be opened by Dr. P. Watson-Williams. Followed by Mr. Foster Moore (Ophthalmology), Mr. F. N. Doubleday (Odontology), Mr. F. S. Rood (Anæsthetics), Sir William Milligan (Otology), and others.

Saturday, Dec. 8th.

OTOLOGY: at 10 A.M.
Cases and Specimens:
Mr. A. H. Cheatle: Three cases of Injury to the Ear, caused by Spirit Injection for Neuralgia.
Sir James Dundas-Grant: Two (old) cases of Radical Mastoid Operation without Plastic.
Cases will also be shown by Dr. T. B. Jobson, Dr. A. R. Friel, and others.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.
WEDNESDAY, Dec. 5th.—8 P.M., Mr. Arthur William Hill: The Work of the Royal Botanic Gardens, Kew.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE, 1, Wimpole-street, W.
MONDAY, Dec. 3rd, to THURSDAY, Dec. 6th.—Lectures at the Hampstead General Hospital, Royal Westminster Ophthalmic Hospital, and the Western General Dispensary (Children's Clinic).

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, Dec. 3rd.—10 A.M., Mr. Maingot: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 2.30 P.M., Mr. Addison: Surgical Wards.
TUESDAY.—11 A.M., Dr. McDougal: Electrical Dept. 12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Dr. Pritchard: Medical Wards.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—11 A.M., Mr. Simson: Gynæcological Demonstration. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.
FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 12 noon, Mr. Endean: Venereal Diseases. 2 P.M., Mr. Sinclair: Surgical Out-patients.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

UNIVERSITY COLLEGE HOSPITAL.
WEDNESDAY, Dec. 5th.—5 P.M., Dr. Charles Singer: Representation of Disease in Art.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Dec. 6th.—4 P.M., Dr. Pearson: Chronic Infections of the Lung.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, Dec. 6th.—5 P.M., Mr. L. C. Rivett: Hydramnios.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
TUESDAY, Dec. 4th.—5 P.M., Dr. A. Whitfield: Fungus Infections.
THURSDAY.—5 P.M., Dr. W. K. Sibley: Acne.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Dec. 5th.—4 P.M., Dr. A. H. Bygott: Problems of Death Certification and Registration.

THE PEOPLE'S LEAGUE OF HEALTH, 12, Stratford-place, Oxford-street, W.
Eight Lectures on the Mind and What We Ought to Know About It, at Hamilton House, Mabledon-place, W.C.
WEDNESDAY, Dec. 5th.—6 P.M., Sixth Lecture, Sir Frederick Mott: Mind and Body.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES.
MONDAY, Dec. 3rd.—(At the Children's Hospital.) Mr. W. A. Thompson: Appendicitis and Intussusception in Children.
TUESDAY.—(At the Southern Hospital.) Mr. O. H. Williams: Diagnosis of Chronic Pain in the Abdomen.
WEDNESDAY.—(At the Northern Hospital.) Mr. Rawlinson: Genito-urinary Cases.
THURSDAY.—(At the Stanley Hospital.) Mr. J. P. Morrison: Surgical Tuberculosis in Adults.
FRIDAY.—(At the Royal Infirmary.) Dr. MacKenna: Eczema and its Treatment.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, Dec. 4th.—4.15 P.M., Mr. J. Morley: Acute Obstructive Cholecystitis.
FRIDAY.—4.15 P.M., Prof. J. S. B. Stopford: The Sensory Pathway.

ANCOATS HOSPITAL.
(Special Course on Surgical Tuberculosis.)
THURSDAY, Dec. 6th.—4.30 P.M., Mr. F. H. Diggle: Otolaryngeal Tuberculosis.

UNIVERSITY OF SHEFFIELD POST-GRADUATE LECTURES.
TUESDAY, Dec. 4th.—(At the Royal Infirmary.) 3.30 P.M., Mr. Cuff: Clinical Cases.
FRIDAY.—(At the Royal Infirmary.) 3.30 P.M., Dr. Barnes: The Early Diagnosis of Gall-stones.

UNIVERSITY OF BRISTOL POST-GRADUATE DEMONSTRATIONS.
FRIDAY, Dec. 7th.—(At Boscombe.) Dr. C. E. K. Herapath: Bradycardia and Tachycardia.

Appointments.

GAYE, A. W., M.B., B.Ch. Camb. & Manch., has been appointed Assistant Medical Officer of Health for Ipswich.

ROTH, P. BERNARD, F.R.C.S. Eng., Orthopædic Surgeon to the London Homœopathic Hospital.

Queen Charlotte's Lying-in Hospital: HALL, N. B., M.B., B.S. Adelaide, Resident Medical Officer; PAGE, HILDA, M.R.C.S., L.R.C.P. Lond., and RAMSDEN, W. M., M.B., B.S., M.R.C.S., L.R.C.P. Lond., Assistant Resident Medical Officers.

Vacancies.

For further information refer to the advertisement columns.

Birmingham and Midland Eye Hospital, Church-street.—Res. S.O. £150. Also Second H.S. £110.

Birmingham City Hospital for Infectious Diseases, Little Bromwich—Sen. Asst. M.O. £350.

Brighton County Borough Mental Hospital, Hayward's Heath.—First Asst. M.O. £700.

Camberwell Infirmary.—Asst. Med. Supt. £500.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. £75.

Colonial Service, British Guiana.—Three Asst. Govt. M.O.'s. £500.

Coventry and Warwickshire Hospital.—Hon. Pathologist. £200.

Darlington Union.—M.O. and Public Vaccinator. £604 14s. 2d.

Derby, Royal Derby and Derbyshire Nursing and Sanitary Association.—Hon. Obstet. P.

Eastbourne, Royal Eye Hospital.—Hon. Anæsthetist.

East London Hospital for Children, &c., Shadwell, E.—Morning Cas. O. £120.

Edinburgh Royal Infirmary.—Supt. £700.

Federated Malay States Hospitals.—Radiologist. £840.

Folkestone, Royal Victoria Hospital.—Res. M.O. £150.

Hampstead General and North-West London Hospital, Haverstock-hill, N.W.—H.P., H.S., Cas. M.O. and Cas. S.O. Each £100.

Hospital for Women, Soho-square, W.—Res. M.O. £100.

Huddersfield, Bradley Wood Sanatorium, &c.—Res. M.O. £500.

Johannesburg, South African Institute for Medical Research.—Asst. Pathologist. £800.

Kensington, Fulham, and Chelsea Hospital, Earl's Court, S.W.—Hon. Anæsth.

Leeds Public Dispensary.—Hon. Radiologist. Also Hon. Dental Surgeon.

Lincoln County Hospital.—Sen. H.S. £250.

London Temperance Hospital, Hampstead-road, N.W.—Cas. O. £150.

Manchester Royal Infirmary.—Sen. Med. Reg. £150. Also Asst. M.O. £35.

Middlesex Hospital, W.—M.O. Electrotherapy Dept. £300. Sen. Asst. Radiologist. £500. Two Asst. Radiologists. Each £100.

Middlesex Hospital and Medical School, W.—Eight Registrarships. Each £300.

National Hospital for the Paralysed and Epileptic, Queen-square, W.C.—Asst. P. Also Res. M.O. £200.

Oxford, Radcliffe Infirmary and County Hospital.—Res. Accoucheur. £120.

Plymouth, South Devon and East Cornwall Hospital.—H.S. £125.

Preston Royal Infirmary.—H.S. £200.

Prince of Wales's General Hospital, Tottenham N.—H.S. £150 Clin. Assts.

Queen Mary's Hospital for the East End, Stratford, E.—Res. M.O. and Res. Obstet. S.

Royal Free Hospital, Gray's Inn-road, W.C.—Asst. P.

Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Hon. P.

St. Peter's Hospital, Henrietta-street, Covent Garden, W.C.—Secretary. £400. Also Clin. Assts.

Salford Royal Hospital.—Anæsthetist. £1 1s. per session.

Union of South Africa Govt.—Asst. P.'s. £460.

University College Hospital, Gower-street, W.C.—Tuberculosis O. £300.

Western Dispensary, 38, Rochester-row, Westminster, S.W.—Resident. £100.

West London Hospital, Hammersmith-road, W.—H.P., H.S., Aural H.S., and Res. Cas. O. Each £100.

Whalley, near Blackburn, Cladderstones Certified Institution for Mental Defectives.—Asst. M.O. £432.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Waltham Abbey (Essex) and Dulverton (Somerset).

Births, Marriages, and Deaths.

BIRTHS.

BARON.—On Nov. 19th, at Golders Green, N.W., the wife of Dr. R. W. Baron, of a daughter.

KANE.—On Nov. 23rd, the wife of M. Kane, M.C., M.B., B.S., of Gwanda, S. Rhodesia, of a daughter.

MCMILLAN.—On Nov. 13th, at Dudley-road Hospital, Birmingham, the wife of Kenneth McMillan, F.R.C.S., of a son.

MARRIAGES.

GALBRAITH—GLEDHILL.—On Nov. 22nd, at the Congregational Church, Bromley, Samuel Nicol Galbraith, M.B., D.P.H., to May, only daughter of the late James Gledhill and of Mrs. Gledhill, "St. Andrew's," Plaistow-lane, Bromley, Kent.

NICHOLS—MASON.—On Nov. 19th, at Seaview, Isle of Wight, Henry Wilfrid Lee Nichols, M.R.C.S., L.R.C.P., to Margaret Dorothy Mason, M.R.C.S., L.R.C.P., elder daughter of Mr. and Mrs. Charles Mason, of Wepener, Seaview.

DEATHS.

ASHTON.—On Nov. 23rd, at Rue Libergier, Rheims, Charles Ernest Ashton, M.R.C.S. Eng.

ELLIOTT.—On Nov. 22nd, in King's College Hospital, after an operation, C. N. Elliott, M.B., J.P., of Oundle, Northants, aged 75.

ROE.—On Nov. 13th, at The Moorings, Gorran Haven, Cornwall, Montagu Walter Roe, M.R.C.S., L.S.A., aged 62.

STILES.—On Nov. 21st, at The Terrace, Spalding, Lincs, Arthur Jalland Stiles, M.D., J.P., aged 63 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE POSITION OF PHYSIOLOGY IN SCIENCE AND MEDICINE.[1]

BY R. J. S. MCDOWALL, D.SC., M.B., M.R.C.P.EDIN.,
PROFESSOR OF PHYSIOLOGY, KING'S COLLEGE, UNIVERSITY OF LONDON.

MEDICINE emerged from the shadow of the Dark Ages in a perilous state, having been held together for 1400 years only by the erroneous theories of Galen, and ruled by blind speculation and dogmatism. With the Renaissance came the rebirth of medicine, particularly of anatomy. Modern physiology owes its beginnings and inspiration to the great anatomists of the sixteenth century; Padua, under the guidance of Vesalius, rose to be the greatest medical school in Europe, and practical observation became the keynote of the new medicine.

Foundations of Modern Physiology.

William Harvey, whose discovery of the circulation was published in 1628, was a graduate of Cambridge who subsequently studied at Padua, whence no doubt he derived much inspiration. Harvey's work marks the dawn of experimental method, and must always remain a masterpiece of physiological reasoning. The tempting subject of the function of the human body naturally attracted physicists, full of the discoveries of Galileo and his contemporaries. Mathematical laws were rigidly applied to physiological problems; for example, Borelli knew that the heart was about the size of the muscles which move the jaw, and by finding the weight which a man could support from his lower jaw he calculated the force of the heart, which he found to be 135,000 lb. Another member of the school, on a dynamical basis, calculated the same force to be 16 oz. Mathematical calculation replaced the necessity for practical experiment and careful observation, and if a warning is necessary for the future, it may be remembered that Borelli, the greatest of the school, died in poverty. For a period physics and mathematics ran riot in physiology, but left nothing of much permanent value, although we know that later these subjects, combined with accurate observation of biological phenomena, have been of enormous value to physiological science.

The chemists, too, were attracted, with more enduring success. The great outcome of the experimental method of Harvey was the clearing of the physiology of the respiration which up to the time of Lavoisier was entirely the work of British scientists. This period is important in the history of chemistry as well as in that of physiology, as by the discoveries of this time chemistry was emancipated from alchemy. The chemists were not perhaps interested in physiology, but they were engaged in what Sir Clifford Allbutt calls the "pathetic quest after oxygen"; having found the latter and the other fundamental gases they retired from the physiological world, no doubt to study the great discoveries in their own subject.

While Harvey's observations were extended and the capillaries discovered, men began to take an interest in the physiology and minute structure of the digestive tract. These advances were for the most part the result of the discovery of the microscope, and we have at this stage the beginnings of histology. We read, too, of the heroic Spallanzani swallowing sponges tied to pieces of string and pulling them up again that he might investigate the nature of the gastric juice. Since the time of Harvey there has been a steady progress in physiology. With a few exceptions, of which the greatest is perhaps the first recording of blood pressure by Stephen Hales, the advances were made on the continent.

British Physiology.

British physiology is only about 100 years old. In the first instance, the anatomists held the field, and great anatomical schools existed in Edinburgh, Cambridge, and London. The anatomists, who were the only physiologists and the only comparative anatomists, soon realised that the subject was becoming too large for them, and set about founding collateral schools of physiology. One of the earliest chairs in physiology was founded in Edinburgh, and from 1847 was held by Hughes Bennett, in whose memory part of the present physiological laboratory was built. The chair was not, however, a full-time one, and was known as the Institutes of Medicine, a striking sidelight on how important physiology was considered. Bennett was succeeded in 1875 by his pupil Rutherford, who, it is interesting to note, was for a period professor of physiology in this College. From the Edinburgh anatomical school there came to University College, London, in 1836 William Sharpey. He was nominally professor of general anatomy, but worked largely at histology, and soon attracted Michael Foster and Burdon-Sanderson to his laboratory. Foster subsequently, on the recommendation of Huxley, went to Cambridge, and Burdon-Sanderson to Oxford, the latter being succeeded at University College by Schafer, who was also a pupil of Sharpey. As in 1899 Schafer went to Edinburgh to succeed Rutherford, the original Edinburgh school is now only represented by the Glasgow school of physiology. With the latter exception all British physiologists are the direct or indirect descendants of Sharpey and his illustrious pupils.

Since his time the science has advanced with great rapidity, but its record is one of personal toil and hardship. It has been said that all science has progressed by men neglecting what they were paid to do—namely, to teach. It would perhaps be more generous to say that it has progressed as the result of the sacrifice of the spare time of those engaged in it. Physiology has had no more devoted disciple and apostle than my illustrious predecessor Prof. W. D. Halliburton, who in the latter part of last century saw what a future there was for chemistry in physiology, and along with Gamgee and Sheridan Lee, must be considered the founder of British biochemistry. His book, the first of its kind in this country, rescued from chaos the subject to which he has devoted his life. He also wrote a text-book on physiology for students, of which for thirty years a new edition has been required on an average of less than every two years. In 1916 he undertook, at first single-handed, the editorship of "Physiological Abstracts," a monumental work now carried on by Sir William Bayliss and four assistants, and now so important that its taking over by the Medical Research Council is, I believe, being considered. Add to a consideration of his literary work the fact that Halliburton was professor of physiology in this College and in the University, and we have not far to seek for the cause of his premature retirement. We are pleased to think that he can once more be amongst us, and it is our best hope that he will long continue his association with the subject and the College in which he has earned the love and gratitude of his fellow-workers.

Physiology as a Separate Subject.

As a science, physiology makes generous use of the cognate sciences chemistry, physics, mathematics, zoology, and botany. It is impossible to study physiology without having some knowledge of these subjects; physiology to-day is a place of exchange, almost too large to be called a subject. The designation professor of physiology has now very little meaning. For the purpose of the M.B. examination the subject is still divided into histology, experimental physiology, and chemical physiology, but in some schools histology comes under the professor of anatomy, as is customary on the Continent, while chemical physiology is taught by a professor of biochemistry. Chairs of physiology are no longer restricted to those having a medical qualification and the advent of the non-medical physiologist, of which there are now four holding chairs, marks a distinct stage in the development of the subject.

Development of Biochemistry.

As physiology attracted men with special training in chemistry, and as the subject developed, these men found it increasingly harder to keep in touch with those parts of the subject which were not obviously chemical. At first known as chemical physiologists, they are now designated under the more general term biochemists. This separation has led not only to the development of the chemical aspects of physiology, but also to increased study of the nature of the substances found in living organisms from the point of view of pure chemistry. For example, a physiologist is extremely interested in the relationship of adrenalin and urea to the functions of the body; but the average biochemist is just as much, if not more, interested in the artificial building-up and chemical formulæ of these substances. In other words, the biochemist is as closely allied to the organic chemist as he is to the physiologist. I have heard it said that modern biochemists are organic chemists who make a living by teaching physiology; this statement is perhaps a little far-fetched, for the biochemist has now developed an intermediate science of his own, with societies, journals, and an entity increasingly distinct. Young men are now taking up a career of biochemistry quite apart from organic chemistry or physiology. Such subdivision is the inevitable result of the rapid growth of the subject, and whether there will be a similar growth on the physical side is a matter of conjecture. There are, however certain indications of a coming advance from the direction of zoology and botany, in both of which there is a vast wealth of uninvestigated physiology.

[1] An extract from the inaugural address delivered at King's College, Oct. 4th, 1923.

Application of Physiology.

But physiology is not a borrower only: it brings new knowledge into the older sciences. The string galvanometer, galvanic electricity, and *beta*-oxidation of fatty acids are examples. The science of physiology pays no heed to its application, nor is it right that it should if real progress is to be made. We must experiment in the cause of knowledge. Many discoveries made in the first instance in the cause of science have subsequently been of enormous benefit to mankind. Who would have thought that the discoveries of Pasteur would have led to the work of Lister? Who would have thought that the Hertzian waves had anything to do with wireless telegraphy? Take also our knowledge of sugar: all sciences have combined in adding to our knowledge of its relation to the animal and vegetable worlds. A vast amount of information has accumulated, but the pure physiologist does not concern himself with whether it is going to be applied to the cure of diabetes or the growing of sugar beet. What was practically insulin was discovered many years ago by Zuelzer, and it appears likely that his experiments failed because he over-dosed his animals. Meantime our knowledge of sugars had greatly increased from the purely scientific aspect; when insulin was again discovered by Banting it was as if a light had been applied to a mass of inflammable material, and all the accumulated knowledge could be applied in an incredibly short space of time for the benefit of mankind. Without the purely scientific advances this application would not have been possible. One is reminded of Spratt, who, when defending the Royal Society for supporting experiments in the cause of mere knowledge, said: "If they are to persist in contemning all experiments excepting those which bring with them immediate gain, they might as well cavil at the providence of God that He has not made all the seasons to be times of mowing, reaping, and harvest."

Physiology and Medicine.

Physiology has a special relation to medicine; we may call physiology the study of the functions of living organs and tissues, while medicine is concerned with the restoration of function which has become abnormal. The physician should therefore know the functions of the various tissues, and the factors on which those functions depend. There was a time when Voltaire said, perhaps with some reason, that doctors were men who poured medicine of which they knew little into bodies of which they knew less; that day is rapidly passing, and the scientific knowledge of the clinician is now as important as his bedside manner. In other words, the art of medicine is being replaced by the science of medicine.

In recent years physiology has been increasingly prominent in medicine. Some of the greatest advances in the treatment of disease have come from physiology—e.g., insulin, thyroid, heart, and kidney therapy. Further, the limitations of physiology are the limits of scientific medicine. Our ignorance of certain diseases, such as nervous diseases or chronic joint conditions, is largely due to our ignorance of the physiology of the parts concerned. The same applies to our knowledge of cancer. As Sir William Bayliss has pointed out, the greatest obstacle is our ignorance of the physiology of the simple cell and cell growth. Physiological literature has become immensely valuable to medicine. Physiology also brings into medicine the methods of science, and these methods are of the utmost value in medical research. The medical student often wonders why he has to learn about old experiments—the medical student lives in constant dread of being over-educated. It is good that he should know how well his predecessors have laboured in his interest, but it is also well that he should know the methods of investigation and to weigh the evidence which results from such investigations that in due course he may apply his knowledge to disease. In this physiology is of enormous value educationally, as the whole subject is made up of methods of investigation and of the results which can be made from the results.

Present Position of Physiology.

To-day physiology has a place of importance it never has had before. The General Medical Council demands more physiology for medical students; the subject is placed on a level with the older pure sciences, and the Royal Society has for the first time a president who is a pure physiologist. But it must not be forgotten that physiology owes its origin to medicine, and especially to anatomy, being taught until comparatively recently by men whose chief interest was really medicine. Medicine has made progress in the subject possible, for the most part providing laboratories and the equipment, and also the means of livelihood for physiologists. There is an increasing tendency for students to take physiology as a science subject, but over 90 per cent. of students who take physiology are still preparing for a medical qualification. Perhaps the words of the late A. D. Waller of this University best sum up the position: "Physiology must be studied for its own sake, but the physiologist whose immediate motive is *the want to know* may not deny his debt of service to the community of which he forms a part and whose services he enjoys. And the channel through which he can repay some part of that debt lies first of all in the service he may be able to render to the practice of medicine—to the knowledge and power of the physician, whose immediate motive is *the want to help*."

The Future of Physiology.

Now we may glance for a moment into the future. It is indeed a difficult problem. The subject is assuming unmanageable proportions. Expansion by medical men and chemists is well begun, physicists have arrived, botanists and zoologists are at the gate. Broadly speaking, botanists have come to the end of their descriptive, systematic, and histological stage, and the majority are now turning their attention to the physiology of the plant. In zoology, too, there has been an increasing tendency to study the living animal; the older zoologists wonder what is going to become of their subject, so many of the younger men are going over to the physiological side.

There seems to be but one solution—namely, the establishment of a definite subject known as general physiology to include all those who are at present studying the sciences of physiology and biochemistry, together with zoological and botanical physiologists. There is a whole field practically unexplored in the physiology of the lower vertebrates and the invertebrates. The study of homologous organs will throw an enormous amount of light on the physiology of the higher animals. General physiology will be a subject of pure science, included in the preliminary scientific studies of the medical student. It will, I believe, be necessary to teach more principles, with logical reasoning not so over-burdened with detail as to obscure those principles.

There will be a special or applied physiology in which the student will be taken further with special regard to application. Agriculturists will be taught by those who are conversant with the problems of agriculture, medical students by those who know medicine. But the teacher must be a physiologist first, and an applied physiologist later; a knowledge of the fundamental subject is essential. In one University at least in America such a plan has actually been adopted and two well-known physiologists, G. N. Stewart and C. J. Wiggers, have been associated with each other; in this country small courses in applied or human physiology have been instituted to augment scientific physiology.

The ideal is, of course, that the student should leave physiology knowing, so far as modern knowledge permits, what is a normal man. This, of course, means close coöperation with the hospitals. It seems to me that those responsible for the training at hospitals during the first three or even six months should be in direct contact with the physiology departments, if not themselves the applied physiologists. No man would ever think of becoming a surgeon without having a special training in anatomy; physiology bears the same relation to medicine that anatomy does to surgery. The surgeons go so far as to insist that prospective Fellows of the Royal College of Surgeons pass not only a special examination in anatomy, but also one in physiology. I feel sure that if it became fashionable for a man to do post-graduate physiology before going into academic medicine, there would be not only an impetus given to physiology, but also a marked advance in scientific medicine. The physician of the future will, I am persuaded, require a special training in physiology before proceeding to pathology and medicine just as the surgeon requires anatomy. Some other method may be found, but undoubtedly this is the problem of the immediate future in physiology and medicine. Some of you may not agree with what I have said; if so, let us not forget the words of Hippocrates: "Art is long, life is short, experience is fallacious, judgment difficult."

MIDWIFERY TEACHING AND PRACTICE IN INDIA:

ELIMINATION OF THE INDIGENOUS MIDWIFE.

THE efforts being made to improve the condition of midwifery teaching and practice in India are slow to bear fruit, but some progress is being made. In 1921 Sir Norman Walker, who was deputed by the General Medical Council of Britain to visit the Medical College of India and investigate as to the teaching in midwifery, made the following remarks after visiting the Medical College and Hospital, Lucknow: "In every respect, save that of midwifery, it seems to me an admirable institution. Its hospitals, its laboratories and its lecture rooms are all very well equipped, but the 'custom of the country' in respect of midwifery is the same as at Lahore, and there is no early prospect of change." This defect in the teaching of midwifery is now being met (according to the Triennial Report[1] of Civil Hospitals and Dispensaries of the United Provinces for the years 1920, 1921, and 1922, just issued by Colonel A. W. R. Cochrane) by deputation of students to the Madras schools. The College admitted 132 students during the triennium as against 90 in the previous three years; all but 11 were residents of these

[1] Allahabad: Government Press. 1923. Rs.2-10-0.

provinces. According to Colonel Cochrane, who is Inspector-General of Civil Hospitals in the United Provinces, the efforts to improve indigenous dhais financed by the Victoria Memorial Scholarship Fund (Rs.6430 per annum) and by Government (Rs.10,000 per annum) has met with but little success, and it has become recognised that, without relinquishing the efforts to bring about improvement, maternity and child welfare will be better served by the training of women of the non-indigenous class as dhais. These will gradually replace the indigenous women and in the meanwhile force her to improve her methods through the results of competition. Further, it is held to be wiser to concentrate all efforts for improvement at four centres and endeavour to secure real results to serve as an object-lesson of what is possible. The death-rate of children under one year, up to 40 per cent. in some places, is, as Colonel Cochrane observes, an appalling figure.

LAËNNEC IN 1824.

THE caricature of Laënnec here reproduced is taken from the pages of the special number of the fortnightly *Journal de Bordeaux et du Sud-Ouest*, published on Sept. 20th on the occasion of the Seventeenth Congress of Medicine held at Bordeaux. It is recalled that the welcome given to the invention of the stethoscope in 1816 was at first no more cordial at Bordeaux than at Paris. In 1824, however, a wealthy Spaniard living near Bordeaux summoned Laënnec (the consultation fee being fixed beforehand at 1000 pistoles, or about 10,000 francs), and the latter took advantage of his visit to demonstrate to the Bordelais physicians his method of auscultation. The caricature, apparently the work of a medical student, was drawn upon one of these occasions, and shows "Laënnec en redingote trop large avec une grosse tête sur des jambes grêles, tenir son stéthoscope comme un joueur de clarinette. La charge est d'autant plus de circonstance que le génial médecin était, on le sait, bon musicien et jouait de la flûte." The *Journal de Bordeaux*, it is interesting to note, will celebrate its centenary in 1929.

THE IMMOBILITY OF THE PLANT-BODY.

AT a recent meeting of the Royal Medico-Chirurgical Society of Glasgow Prof. F. O. Bower, F.R.S., pointed out that the fact that ordinary plants are fixed in the soil and therefore stationary is so familiar that we pay little attention to it, and often remain quite blind to the far-reaching consequences which it entails. Since Darwin's book on the Movements of Plants was published, it has become common knowledge that plants do move, though under restrictions by their encysting walls. The protoplasts of an adult tissue can only move within their restricting prison, and the plant as a whole is immobile. The rooted position is, however, clearly effective for purposes of photosynthetic nutrition. The immobile plant can nourish itself and provide food also for the rest of the organic world; but its immobility imposes restrictions which have affected the whole course of plant evolution. So long as water is the medium in which plants live, and the gametes are motile in it, and especially if there are means of directing their movements to the right spot, fertilisation is possible for algæ. In land plants, however, difficulties at once arise. By peculiar specialisation mosses and ferns are still able to subsist on land, using "casual water" as the necessary medium for fertilisation, but are thus necessarily restricted to habitats where "casual water" is at all events sometimes available. On the other hand, the fully fledged land plant has to do without it. This is the reason for all those wonderful pollination mechanisms which have become the playground of botanical science. Mechanical ejection, air and water transit, and animal agency play their part; and pollination, the necessary step to fertilisation, is thus made possible for the immobile plant. When the seed is ripened a fresh difficulty arises in the spread of the seeds so that each shall have its chance. Again ejection, wind, water, and animal agency are called in with curiously parallel though distinct results.

Prof. Bower went on to state that there is yet another disability following from the immobile habit. The plant is the passive victim of predatory animals, being unable to escape by speed or cunning. Pasture grasses and clover, and any fodder plants are the natural prey of the grazing animal. Their sole resource is to restore as quickly as possible the parts that have been lost. Some plants develop poisonous or offensive juices, while others are no doubt protected from attacks by snails by the sharp crystals called raphides which are imbedded in mucilage; this swells as the tissues are gnawed, the cells rupture, and the sharp needles penetrate the delicate mouth of the marauder. It has been shown by experiment that even hungry snails avoid plants so protected. It thus appears that the whole evolution of plants has been overshadowed by the early sacrifice of mobility. Truly for them, "C'est le premier pas qui coûte." Encystment, while it secures protection, raises also many difficulties, and the further evolution of the plant has largely consisted in living them down. The wonder of it is that plants have succeeded as well as they have done. Necessity, with them, has indeed been the mother of invention.

THE KIND OF NURSE SHE WANTS.

To the Editor of THE LANCET.

SIR,—I have just recovered from a troublesome prolonged but not very dangerous illness in which I badly wanted someone to wash me, to bring me my food, to make my bed, and in fact to attend to my physical needs. My doctor wished me to engage a trained nurse, a demand with which I should have been only too happy to comply if it had been possible to provide the extra accommodation, household service, and the meals more elaborate than the usual family ones. I could not face the prospect of having a guest who was entitled to a higher standard of comfort than that of my very modest household. The situation is a familiar one for which I can see no solution. Maybe there is no solution. I enclose my card and sign myself yours faithfully

A MIDDLE-CLASS PATIENT.

*** We deal with this letter in a leading article.—ED. L.

THE CONSTANT CURRENT IN GRAVES'S DISEASE.

Dr. Stephen Portret, of Paris, has recently called attention (*Bulletin Officiel de la Société Française d'Électrothérapie*) to the fact that a certain number of cases of Graves's disease are resistant to radiotherapy, while they may be amenable to the older method of treatment by constant current. After giving details of the technique employed, Dr. Portret quotes a number of these resistant cases that seem undoubtedly to have improved under the electrical applications. It is presumed that the method would not be considered applicable to any very large proportion of cases; it would be unsuitable for cases in which tachycardia was present, due to permanent myocardial changes. Radiologists might, however, with profit bear in mind the possibilities of help from electrical methods particularly when the skin of the neck demands a rest from radiological exposures.

A STUDENT "DOCTOR."

AT Woolwich an inquest was held on the body of a widow, 72 years of age, whose death was shown by post-mortem examination to have been due to chronic ulceration of the stomach and a ruptured blood-vessel. During her last illness she had been attended by a man, who on his door-plate described himself as "Dr. C. W. O'Donoghue," but who in the witness-box stated that he held the diploma of State Medicine in India, and admitted that he was not qualified to practise in this country. He stated, however, that he was a student, and that he was about to take his final examination. The woman had died while being examined by him with a qualified doctor, who had been invited to consultation. The coroner made forcible comment on O'Donoghue's story, saying that the case was a flagrant breach of the Medical Act, that O'Donoghue must have known that he had no right to practise as he had done, that he hoped that the Medical Defence Union would take action, and that O'Donoghue would fail to secure registration. He expressed sympathy with a qualified practitioner at his having been in anyway connected with such a man, who, he said, could neither spell medical terms nor pronounce them.

Dr. J. A. Marsden, in a communication, asks the question: Why is it practically impossible for cancer to grow in young persons? His own deduction is that spontaneous cure of cancer might take place in adults from the restoration of the influence which is protective in youth. He suggests that patients with this disease should be treated by interstitial grafting or by administering extract of the cells of Leydig.